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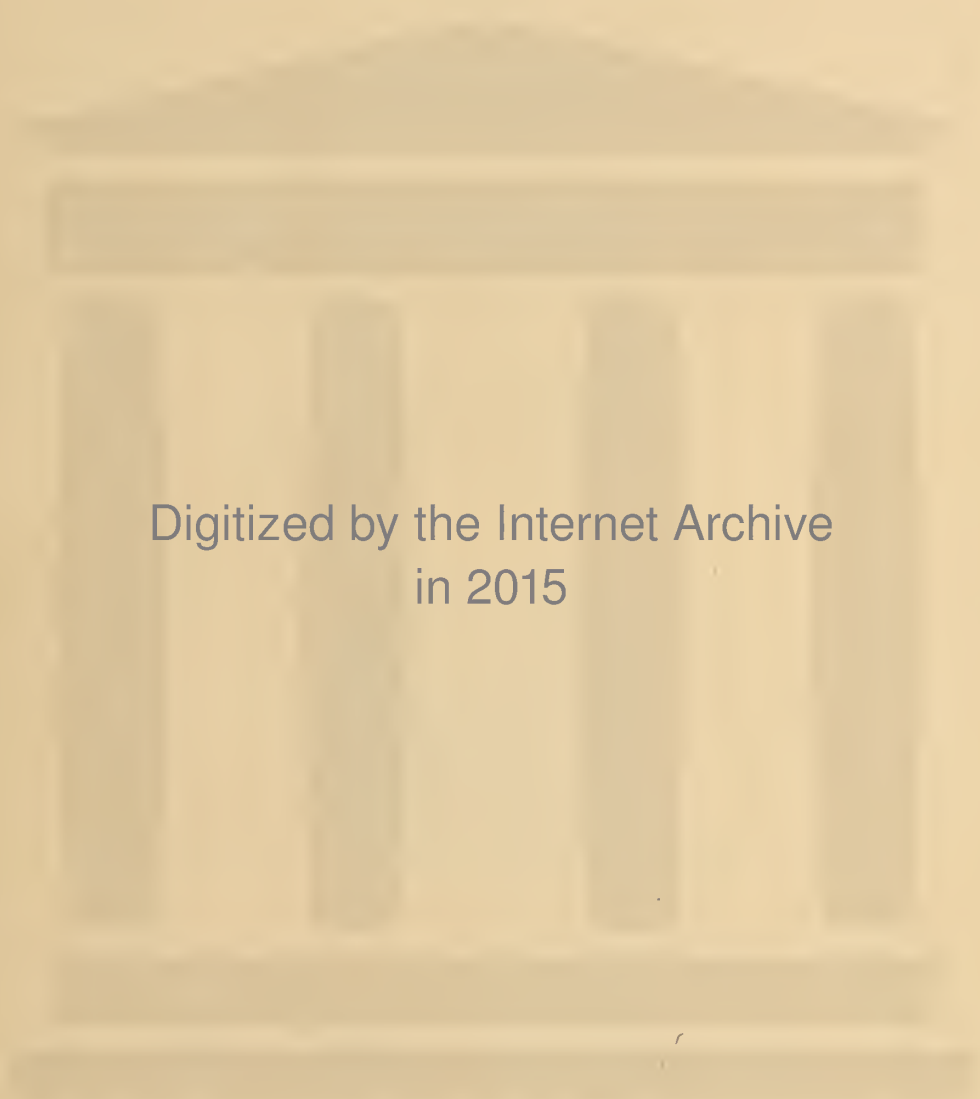


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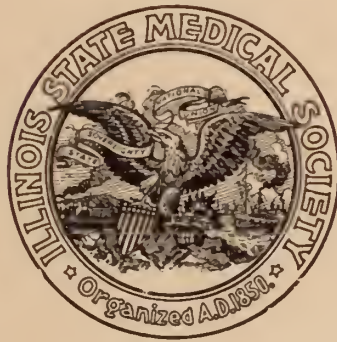
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INDEX TO VOLUME 71

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# INDEX TO VOLUME 71

JANUARY TO JUNE, 1937

This is an alphabetical index of articles and discussions arranged by leading words. It contains occasional cross references. Names of authors and men who discussed the papers are also included. Details of society proceedings, including the titles of papers

read, officers elected, etc., can be located in proceedings under Societies, Editorials, News of the State, Marriages, Deaths. The subjects of editorials also appear alphabetically and are marked (E).

A		Bedell, Arthur J. Paper. . . . .	238	Cooper, Hugh E. Paper. . . . .	204
		Beilin, Leon M. Paper. . . . .	85	Corcoran, Wm. J. Paper. . . . .	426
Addison disease crisis re coronary thrombosis. Herbert A. Sacks, Chicago . . . . .	475	Berghoff, Robert S. Paper. . . . .	234	CORRESPONDENCE:	
Allergy of eye, ear, nose and throat. Leon Unger, Chicago. . . . .	45	Berkey, H. A. Paper. . . . .	152	Alumni Association, University of Illinois. Charles H. Phifer. . . . .	374
Amebiasis, clinical aspects. Samuel E. Munson, Springfield. . . . .	21	Bishkow, I. Edward. Paper. . . . .	172	A Little Sample. A. R. Reder. . . . .	16
Amebiasis, laboratory diagnosis. Bertha Kaplan Spector, Chicago. . . . .	25	Bondurant, Flint. Paper. . . . .	480	Answer to Women as Slaves in Industry. Carolyn N. Macdonald . . . . .	289
Amebiasis, medical management. Arthur E. Mahle, Chicago. . . . .	33	Bothman, Louis. Paper. . . . .	229	Beg Your Pardon. Kellogg Speed . . . . .	373
Amebiasis, surgery. Gatewood, Chicago . . . . .	41	Boylan, Charles E. Paper. . . . .	490	Braunwarth, Dr. Anna M. Thomas P. Foley . . . . .	106
American Foundation report (E). . . . .	457	Broadwell, Stuart. Discussion. . . . .	337	Competitive Examination for Medical Corps . . . . .	288
American medicine vs. non-medical persons. (E) . . . . .	279	Burstein, H. J. Discussion. . . . .	87	Deaf-blind child wanted. H. S. Hulbert . . . . .	467
Angina pectoris and coronary disease. Robert S. Berghoff, Chicago. . . . .	234	C			
Annual meeting of 1937. (E) . . . . .	463	Cardiac Review for 1936. Nathan Flaxman, Chicago . . . . .	509	Diphtheria immunization. Frank J. Jirka . . . . .	466
Anti-syphilis campaign. (E). . . . .	2	Calcinosis cutis. Jerome G. Finder, Chicago . . . . .	219	Illinois State Nurses. Edna S. Newman . . . . .	198
Appendicitis, acute. M. S. Underhill, Evanston . . . . .	331	Cancer, Max Cutler, Chicago. . . . .	413	Inversion of the uterus. O. H. Christ . . . . .	15
Appendicitis, an emergency. Golder Lewis McWhorter, Chicago. . . . .	179	Cancer of lung, unusual features. Cecil M. Jack, Decatur. . . . .	315	Legislative trends in Illinois. J. R. Neal . . . . .	286
Arnold, Lloyd. Discussion. . . . .	135	Carbon tetrachloride re adhesive tape. (E) . . . . .	190	Medical legislation. John R. Neal . . . . .	15
Arthritis, management of. Roger T. Farley, Chicago . . . . .	74	Cesarean section. Willard C. Scrivner, E. St. Louis. . . . .	436	Morgan County to honor Dr. Black . . . . .	287
Arthritis re vitamin D. Irving E. Steck, Chicago . . . . .	243	Chicago Medical Society hold up insurance. (E) . . . . .	99	Northwestern medical conference. . . . .	107
Aspirin and aspirin with calcium re arthritis. A. M. Serby and S. Sideman, Chicago . . . . .	140	Christoph, Carl H. Paper. . . . .	176	Spinal Puncture easy. F. T. Brenner . . . . .	467
B		Club dues vs. Medical Society dues. (E) . . . . .	13	Smallpox. Frank J. Jirka. . . . .	105
Bacteria disappearance from eye lids and conjunctivitis. G. Howard Gowen, Springfield . . . . .	216	Coleman, Dr. James Edmund of Canton Succumbs. (E). . . . .	462	Veteran service committee dinner. . . . .	291
Beck, Joseph C. Paper. . . . .	333	Coleman, E. P. Paper. . . . .	12	Washington University Alumni. Nancy L. Blair. . . . .	374
Beck, Joseph C. Discussion. . . . .	178	Communitistic law making. (E). . . . .	188	Woman's Auxiliary. Inez Hole. . . . .	107
		Compulsory health insurance by actuary. (E) . . . . .	98	Mrs. V. M. Seron. . . . .	18, 198
		Compulsory health insurance by propaganda. (E) . . . . .	3	Cottle, H. M. Discussion. . . . .	436
		Conception control failures. Leo J. Latz and E. Reiner, Chicago. . . . .	210	Coulter, John S. Paper. . . . .	136
		Consistency a jewel. (E). . . . .	97	Cryptitis. Charles J. Drucek, Chicago . . . . .	52*
				Cyst of kidney, Solitary. Charles E. Boyland, Chicago . . . . .	490
				Cutler, Max. Paper. . . . .	413

## D

## DEATHS:

- Anderson, August. Chicago..... 456  
 Andrus, S. Claude. Rockford..... 456  
 Ash, John Roscoe. Brighton..... 456  
 Avery, Elmer K. Chicago..... 363  
 Axline, Clarence E. Peoria..... 184  
 Banker, Edward U. Aurora..... 364  
 Bass, Luther G., Chicago..... 540  
 Beebe, John Eddowes. Chicago... 184  
 Berthold, Theodore William. Chicago ..... 91  
 Beveridge, James M. Oregon.... 184  
 Blim, Charles. Crete ..... 91  
 Bradford, Eli H., Rock Island Ill. 540  
 Bohart, William H. Vero Beach, Fla. .... 184  
 Boies, Henry M. Albany..... 456  
 Bryant, James B. Lawrenceville... 184  
 Carpenter, Estella Clark. Chicago 456  
 Champlin, Sherman H. Chicago... 364  
 Chapin, Clarence W. Clinton.... 364  
 Chrzanowski, Leo Alexander. Joliet 364  
 Clark, Lewis E., Mansfield, Ill.... 540  
 Coleman, James Edmund, Canton.. 462  
 Cook, William Wesley. Chicago... 184  
 Cooke, Harold Ivan A. Chicago.. 91  
 Cowles, George Henry. Woodhull.. 92  
 Crutcher, Howard. Joliet..... 92  
 Cunningham, James E. Chicago.. ..... 456, 540  
 Daggett, Le Roy H. Chicago..... 456  
 Daly, Victor Mackay. Pontiac.... 92  
 Dempsey, William H. Alton..... 456  
 Dewey, Alvin P., Elgin, Ill..... 540  
 Dickerson, Orval Melcher. Cairo. 364  
 Dixon, William C. Greenville.... 456  
 Doherty, Neill John. Crystal Lake 364  
 Donovan, Samuel D. Dewey..... 275  
 Doss, Judson Irwin. Milton..... 364  
 Eicher, William B. Peoria..... 275  
 Eyster, George Loughhead. Coral Gables, Fla. .... 364  
 Fahrner, John, Sr. Joliet..... 456  
 Finnell, Joseph J. L., Peoria, Ill.. 540  
 Finn, Walter Louis. Iuka..... 184  
 Fischer, Charles Eduard. Chicago. 184  
 Fuchs, Albert Eugene. Bunker Hill 92  
 Gahagan, Henry J. Chicago..... 92  
 Grassau, Andrew. Caledonia..... 456  
 Green, George Willard. Chicago.. 364  
 Guild, William Lyman. Wayne... 275  
 Hardie, Robert. Chicago..... 364  
 Harnay, Louis G. E. St. Louis... 184  
 Harvey, Frederick. Chicago..... 92  
 Hays, Theodore Calvin. Canton... 92  
 Heflin, H. Nelson. Kewanee..... 456  
 Hoffman, Coleman Lovejoy. Oak Park ..... 275  
 Howard, Sullivan. Elk Creek, Neb. .... 275  
 Hughes, Thomas. Chicago..... 456  
 Johnstone, A. Ralph. Chicago.... 364  
 Jones, Charles L. Noble..... 456  
 Jones, Hugh Owen. Chicago..... 184  
 Keener, Albert Chester. Altona.. 364  
 Krohn, Henry Walter, Kane, Ill.. 540  
 Kurz, Henry Grover. Chicago... 275  
 Laswell, Samuel L., Alma, Ill.... 540  
 Lawson, James Francis. Chicago.. 184  
 Lehman, Samuel, Dixon, Ill..... 540  
 Leitzbach, Augustus John. Fairmount ..... 92  
 Lindsay, Charles Elder. Chicago.. 364  
 Little, Finis Coleman. East St. Louis ..... 92  
 Lowenthal, Albert A. Chicago.... 456  
 Luehr, Edward. Chicago..... 364  
 MacCracken, William Patterson. Chicago ..... 364  
 McGrath, William Weir. Savannah 364  
 McIntyre, James Edward. Tremont 364  
 McLane, George Albert. Harvard. 92  
 Mann, William Alfred, Sr. Chicago 92  
 Mansfield, Willis A. Washington. 184  
 Marshall, Norman Buell. Chicago. 456  
 Martin, Delmar Ivan. Springfield. 456  
 Meserve, Arthur G. Robinson.... 184  
 Metzel, Charles Himes. Sidney... 184  
 Meyerovitz, Morris. Chicago..... 456  
 Mix, Harry Collier. Oak Park.... 92  
 Murphy, John Michael. Chicago.. 276  
 Neall, John Howard. Quincy..... 92  
 Oren, Samuel Allen. Lewistown.. 276  
 Paine, Albert George. Chicago... 184  
 Parker, Alfred James. Chicago... 92  
 Parker, John Aloysius. Chicago... 364  
 Pecival, Joseph P. Berwyn..... 276  
 Pettyjohns, Elmore Soan. Chicago. 92  
 Pickerill, James Thomas. Chicago. 92  
 Pierce, George Frederick. Chicago. 276  
 Piper, Ralph S. Chicago..... 364  
 Porter, Elza Carl. Chicago..... 276  
 Polkey, Hugh James. Chicago..... 184  
 Pribble, Eugene B. Salem..... 276  
 Riebel, Ernest Charles, Chicago... 540  
 Rightman, William. Chicago..... 364  
 Roth, Lee Robert. Chicago..... 92  
 Rothstein, Thor Christian. Chicago 456  
 Schaps, Theodore. Chicago..... 276  
 Schott, Charles. Chicago..... 92  
 Schwied, Ellis. Chicago..... 92  
 Siemianowski, Aurelius Thomas, Chicago ..... 540  
 Smith, Frank Segal. St. Peter.... 92  
 Smith, Joseph P. Chicago..... 184  
 Smith, Samuel Breese. Chicago... 184  
 Smithies, Frank. Chicago..... 276  
 Socoloff, Boris. Chicago..... 92  
 Springer, Joseph C. Chicago..... 184  
 Squire, Marguerite Gilham. Carrollton ..... 364  
 Stearns, William Guilford, Chicago 276  
 Stocker, Alfred, Rock Island, Ill.. 540  
 Thompson, Osmond Peter, Chicago 540  
 Tierney, Charles Joseph. Cicero... 92  
 Tilton, Sarah V., Rossville, Ill.... 540  
 Torrey, George W. Chicago..... 184  
 Tremblay, Alfred, Moline, Ill.... 540  
 Tucker, Henry Stevens, Chicago.. 540  
 Tuthill, John A. LeRoy..... 184  
 Van Hook, Forest Clyde. Mt. Pulaski ..... 456  
 Wash, George W. Gibson City.... 92  
 Watson, Frederick John, Chicago.. 549  
 Weber, Samuel Louis. Chicago.... 276  
 Weir, Silas Wilkin. West Union.. 456  
 Wilcox, Samuel Hall. Carlyle .... 364  
 Williams, Walter James. Edwardsville ..... 184  
 Winegar, Edwin F. Chicago..... 276  
 Wylie, James S. Matheson. Chicago 184  
 Zimmermann, Ernst, Quincy, Ill.. 540  
 Death from natural causes, Sudden. Edwin F. Hirsch, Chicago..... 531  
 Decker, Fred H. Paper..... 319  
 Dental profession re state medicine. (E) ..... 185  
 Dividends of the depression. A. R. E. Wyant, Chicago..... 262  
 Doctor vs. physical educator. (E).... 187  
 Don't grumble about dues. (E)..... 11  
 Drucek, Charles J. Paper..... 528

## E

## EDITORIALS:

- American Foundation Report..... 457  
 American medicine vs. non-medical persons ..... 279  
 Annual Meeting of 1937..... 463  
 Anti-syphilis campaign ..... 2



# VOLUME INDEX

v

Carbon tetrachloride re adhesive tape .....	190	Epileptic seizures vs. prostatitis. C. Otis Ritch, Chicago.....	481	Hecfel, Norris J. Paper .....	152
Chicago Medical Society holdup insurance .....	99	Erlanger, Gustav. Discussion.....	435	Hip fracture re Roger Anderson treatment. H. D. Junkin, Paris.....	199
Club dues vs. Medical Society dues .....	13	Ethics vs. economics. Chas. S. Skaggs, E. St. Louis .....	379	Hirsch, Edwin F. Paper.....	531
Coleman, Dr. James Edmund of Canton, Succumbs .....	462			Hollander, A. R. Discussion.....	53
Communist law making .....	188	F		Hoyne, Archibald L. Discussion....	331
Compulsory health insurance propaganda .....	3	Farley, Roger T. Paper .....	74	Hubeny, M. J. Discussion.....	73
Compulsory health insurance by actuary .....	98	Femur fracture re Whitman spica cast. Hugh E. Cooper, Peoria....	204	Hutton, James H. Paper.....	469
Consistency a jewel.....	97	Finder, Jerome G. Paper.....	219	Hypotension, low arterial pressure. D. M. Roberts, Alton.....	448
Dental profession re State Medicine .....	185	Fistula, rectal—horseshoe type. M. H. Streicher, Chicago .....	224		
Doctor vs. physical educator.....	187	Flaxman, Nathan. Paper.....	509	I	
Don't grumble about dues.....	14	Frech, Lee. Paper .....	267	Illinois State Medical Society program. (E) .....	292
Group hospitalization .....	93, 94			Illinois State Medical Society official program. (E) .....	375
Happy New Year .....	1	G		Illinois Tuberculosis Association....	285
Health insurance agitation.....	4	Gailey, Watson W. Paper.....	150	Immunization against contagious diseases. Lee Frech, Decatur.....	267
Illinois State Medical Society program .....	292	Gall-bladder and bile duct, surgery of. Charles B. Puestow, Chicago....	54	Infant mortality, reducing. Henry C. Niblack, Chicago .....	109
do, official program.....	375	Galloway, T. C. Discussion.....	327, 337	Influenza, experimental. Hugh McDonald and E. J. McDonald, Evanston .....	350
Medical costs, layman interest....	95	Garve, Kurt. Paper .....	264	Isaacs, Harry J. Paper.....	161
Medical officials or Doctors.....	367	Gastroscopy, Indications for. Marie Ortmyer, Chicago .....	482		
Motor accidents increasing.....	277	Gatewood, Paper .....	41	J	
National cancer campaign .....	189	Gianturco, Cesare. Paper .....	67	Jack, Cecil M. Paper.....	315
1937 annual meeting .....	188	Gianturco, C. Discussion.....	269, 323	Jaffe, Richard H. Discussion.....	45
Panel system curretnments .....	280	Gillespie, James B. Paper.....	429	Jelly-belly. Walter W. Voigt, Chicago. 172	
Pharmacy, medicine's handmaid....	186	Gillies operation for fracture deformities. Paul W. Greeley, Winnetka..	419	Jirka, Frank J. Paper.....	130
Postgraduate courses .....	191	Glennon, Kathryn. Paper.....	477	Jonas, Emil. Paper .....	420
Reed, Dr. Charles B. testimonial dinner .....	464	Gonorrhea, treatment of. Leon M. Beilin, Chicago .....	85	Junkin, H. D. Paper .....	199
Short stories, long conclusions....	365	Gowan, G. Howard. Paper.....	132, 216		
State medicine, cost and taxes....	368	Gray, Howard K. Paper.....	411	K	
State medicine doses the well.....	190	Greeley, Paul W. Paper .....	419	Keating, Emmet. Paper.....	63
Vital statistics vs. prophesies.....	368	Group hospitalization. (E).....	93, 94	Kenner, W. H. Paper .....	248
Why I am a Doctor.....	96	Group hospitalization. C. E. Wilkinson, Danville .....	102	Kirkwood, Tom. Paper.....	58
Wisconsin history by a Doctor....	99	Guttman, M. Reese. Paper.....	333	Kleinman, B. S. Paper.....	127
Woman's army to fight cancer....	100	Gynecological diagnosis, Points in. Otto S. Krebs, St. Louis, Mo....	501	Krebs, Otto S. Paper.....	501
EDUCATIONAL COMMITTEE:				Kretschmer, Herman L. ....	152
January-February .....	196	H			
December report .....	16, 196	Halley, E. P. Discussion .....	322	L	
January-February .....	196	Happy New Year! (E) .....	1	Latz, Leo J. Paper.....	210
Health Columns .....	106	Harger, John R. Paper.....	165	Lawrence-Moon-Biedl Syndrome. James B. Gillespie, Urhana.....	429
April-May .....	467	Hawley Clark W. Paper.....	489	Lesemann, F. J. Paper.....	495
Edison, Samuel L. Paper.....	431	Head, Jerome R. Paper.....	498	Levitt, R. O. Paper .....	442
Emotions re gastroduodenal ulcers. Samuel C. Robinson, Chicago.....	339	Health insurance agitation. (E)....	4	Lindsay, J. R. Paper.....	323
Empyema complication artificial pneumothorax. Jerome R. Head, Chicago .....	493	Heart, activities of. Emmet Keating, Chicago .....	63		
Endocrine progress re hypertension and diabetes mellitus. James H. Hutton, Chicago .....	469				
Ephedrine re common cold. G. Howard Gowan and Alexander J. Nedzel, Chicago .....	132				

- M**
- Magee, Harry. Discussion ..... 318
- Magnuson, Paul B. Discussion..... 207
- Mahle, Arthur E. Paper ..... 33
- Malaria recrudescence. Tom Kirkwood, Lawrenceville ..... 58
- MARRIAGES:**
- Ahearn, Thomas F., Jr. Chicago... 89
- Arnold, Romus. Joliet ..... 453
- Bell, Joseph Sloan. Hoopeston..... 89
- Breakstone, Judd R. Chicago..... 453
- Collins, James J. Galena..... 361
- Costigan, Clarence S. Moline..... 453
- Darner, Leslie D. Granite City... 453
- Gustafson, Joseph G. Moline..... 453
- Kesler, Roland Lincoln. Chicago... 273
- Kline, Cornelius E. Assumption... 361
- Pearson, Emmet F. Springfield.... 273
- Rosi, Peter A. Chicago ..... 89
- Masters, Thomas D. Discussion.... 330
- McCuskin, J. N. Discussion..... 229
- McDonald, Hugh and E. J. Paper... 350
- McEvers, Albert E. Paper..... 441
- McGuire, James P. Paper..... 526
- McGuire, Philip. Paper ..... 526
- McNally, William D. Paper..... 115
- McNally, William D. Discussion... 147
- McWhorter, Golder Lewis. Paper... 179
- Mechanical and laboratory aids to diagnosis. Geo. Parker, Peoria... 169
- Medical costs, layman interest. (E)... 95
- MEDICAL ECONOMICS:**
- Ethics vs. economics. Chas. S. Skaggs ..... 379
- Group hospitalization. C. E. Wilkinson ..... 102
- E. S. Hamilton ..8, 101, 192, 282, 370
- Medical Economics. E. S. Hamilton 465
- Medical service for the poor. John R. Neal ..... 9
- President's address. J. S. Templeton ..... 193
- Problems confronting medical practice. E. P. Coleman..... 12
- Public and the future of medicine. R. K. Packard ..... 283
- Medical officials or Doctors. (E).... 367
- Medical service for the poor. John R. Neal, Springfield ..... 9
- Mendelsohn, Jacob J. Paper..... 484
- Meningococcic meningitis re anti-toxin. Winston H. Tucker, Springfield ..... 328
- Middleton, A. B. Discussion....139, 178
- Miller, H. P. Paper ..... 422
- Mononucleosis, infectious. Harry J. Isaacs, Chicago ..... 161
- Morginson, Wm. J. Paper..... 226
- Motor accidents increasing. (E).... 277
- Mundt, G. H. Discussion..... 327
- Munson, Samuel E. Paper..... 21
- Myxoma, huge retro-vesical. Emil Jonas, Chicago ..... 420
- N**
- Nachman, A. R. Paper ..... 442
- National cancer campaign. (E).... 189
- Neal, John R. Paper..... 9
- Nedzel, Alexander J. Paper..... 132
- Negative tuberculin reactors. John Ritter, Miami ..... 347
- Newcomb, W. H. Discussion..... 165
- Niblack, Henry C. Paper..... 109
- 1937 annual meeting. (E)..... 188
- Nugent, O. B. Discussion...53, 140, 435
- O**
- Occupational disease problem. C. O. Sappington, Chicago ..... 143
- Ockuly, E. A. Paper ..... 152
- Olin, H. A. Discussion.....73, 260, 322
- Oliver, J. A. Discussion.....178, 327
- Ophthalmoscopic signs of failing health. Arthur J. Bedell, Albany, N. Y. .... 238
- Ortmayer, Marie. Paper..... 482
- Otis, F. J. Discussion..... 208
- Otitis media re iodine powder. Carl H. Christoph, Chicago..... 176
- P**
- Packard, R. K. Paper ..... 283
- Pain in Workmen's Compensation Cases. Kurt Garve, Los Angeles, Calif. .... 264
- Panel system curretnments. (E) .... 280
- Parker, George. Paper ..... 169
- Pearce, Warren. Discussion..... 67
- Peptic ulcer, surgical treatment. Howard K. Gray, Rochester, Minn.... 411
- Pearson, E. F. Discussion..... 135
- Pernicious anemia simulating leukemia. Albert Van der Kloot, Chicago ..... 487
- Petrositis treatment. Joseph C. Beck and M. Reese Guttman, Chicago... 333
- Pettit, Roswell T. Discussion..... 83
- Pharmacy, medicine's handmaid. (E). 186
- Pharyngeal diverticula. Albert E. McEvers, Los Angeles, Calif..... 441
- Physical therapy in office practice. H. P. Miller, Rock Island..... 422
- Physical therapy re eye, nose & throat. John S. Coulter, Chicago..... 136
- Pickett, William J. Paper..... 442
- Pncumothorax therapy. Jacob J. Mendelsohn, Chicago ..... 484
- Poisoning, classification, diagnosis and treatment. William D. McNally, Chicago ..... 115
- Polymyositis, sub-acute. Edward H. Warszewski and John M. Radzinski, Chicago ..... 351
- Pregnancy, Combined extra and intrauterine. Flint Bondurant, Cairo 480
- Postgraduate courses. (E) ..... 191
- President's address. J. S. Templeton, Pinckneyville ..... 193
- Problems confronting medical practice. E. P. Coleman, Canton..... 12
- Prostatitis, chronic—1000 cases. Herman L. Kretschmer, H. A. Berkey, Norris J. Heckel, E. A. Ockuly, Chicago ..... 152
- Prostatitis and vesiculitis re heat. W. H. Kenner, Chicago..... 248
- Pterygium operation. Clark W. Hawley, Chicago ..... 489
- Public and future of medicine. R. K. Packard, Chicago ..... 283
- Puestow, Charles B. Paper..... 54
- R**
- Radium therapy in malignancy. Frank Edward Simpson, Chicago ..... 77
- Radium treatment of secondary parotitis. Fred H. Decker, Peoria..... 319
- Raw apple dietary. Wm. J. Corcoran, Chicago ..... 426
- Reiner, E. Paper ..... 210
- Repercussion therapy. E. G. C. Williams, Danville ..... 257
- Ritch, C. Otis. Paper..... 481
- Ritter, John. Paper ..... 347
- Roberts, D. M. Paper..... 338
- Robinson, Samuel C. Paper..... 338
- Roentgenological examination of the colon. Cesare Gianturco, Urbana... 67
- Rogers, J. C. T. Discussion ..... 57
- S**
- Sacks, Herbert A. Paper..... 475
- Sappington, C. O. Paper..... 143

Sarcoma, Neurogenic. I. Edward Biskow, Chicago	472
Schnitz, Herbert. Discussion	322
Scientific exhibits awards. (E)....	461
Scopolamine and atropine cycloplegia. Louis Bothman, Chicago	229
Scribner, Willard C. Paper	436
Sendle cataract extraction, accidents and errors. Watson W. Gailey, Bloomington	150
Sepsis of cryptogenic origin, Fred'k Stenn and Walter Zeiter, Chicago..	261
Serby, A. M. Paper	140
Sideman, S. Paper....	140
Short stories, long conclusions. (E)...	365
Sinusitis, chronic in children. J. R. Lindsay, Chicago	323
Skaggs, Chas. S. Paper....	379
Skin manifestation of drugs. Wm. J. Morginson, Springfield.....	226
Sloan, Leroy H. Discussion.....	63
Simpson, Frank Edward. Paper	77

## SOCIETY PROCEEDINGS:

## Cook County:

Chicago Medical Society	
Dec. 2	88
Jan. 6, 20	181
Feb. 3	272

## Greene County:

Dec. 11	88
Nov. 12	361

## Hancock County:

Jan. 5	181
--------	-----

## Henry County, May 6.....

Kankakee County:	
Dec. 11	88

## McLean County:

Apr. 15	361
---------	-----

## Mercer County:

Apr. 14	453
---------	-----

Ogle County:	
Apr. 22	453
Pike County:	
Jan. 28	273
Spector, Bertha Kaplan. Paper....	25
State medicine, cost and taxes. (E)...	368
State medicine does the well. (E)...	190
Steck, Irving E. Paper.....	243
Stenn, Frederick. Paper	261
Stevenson, Walter. Discussion ..177, 327	
Streicher, M. H. Paper..	224
Syphilis, prenatal—preventable. S. J. Zakon, Chicago	438

## T

Fempleton, J. S. Paper	193
Thacker, E. A. Paper	354
Traut, Eugene F. Discussion.....	46
Tuberculosis control re tuberculin x-ray. E. A. Thacker, Urbana	354
Tucker, Winston H. Paper	328

## U

Underhill, M. S. Paper....	331
Unger, Leon. Paper	47

## V

Vaginal hernia. James P. and Philip McGuire, Chicago.....	526
Van Alyea, O. E. Discussion....	327
Van der Kloot, A. Paper.....	487
Varicose veins, modern management. Leon M. Zimmerman, Chicago....	444
Venereal disease situation. Frank J. Jirka, Springfield	130

Visceral pain. F. J. Leseemann, Chicago	495
Vital statistics vs. prophecies. (E)...	368
Vitamin F Ointment. M. L. Weinstein and Kathryn Glennon, Chicago	477
Voigt, Walter W. Paper.....	172
Vonachen, John R. Discussion.	271

## W

Walsh, Theo. E. Discussion	326
Weinstein, M. L. Paper.	477
White, C. P. Discussion....	58
Why I am a Doctor. (E)...	96
Wilkinson, C. E. Paper.....	102
Williams, E. G. C. Paper	257
Discussion	84
Wisconsin history by a Doctor. (E)...	99
Woman's army to fight cancer. (E)...	100
Women slaves to industry. John R. Harger, Chicago	165
Woodruff, George. Discussion ..178, 327	
Wyant, A. R. E. Paper.....	262

## X

X-ray in lead colic. William J. Pickett, A. R. Nachman, R. O. Levitt, Chicago	442
---	-----

## Z

Zakon, S. J. Paper.....	438
Zeiter, Walter. Paper	261
Zimmerman, Leo M. Paper.....	444
Zinc ionization re trachoma. Samuel L. Edison, Chicago	431
News Notes	89, 183, 274, 362, 455
Personals	89, 181, 273, 361, 453





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## CONTENTS:

Editorials (For Titles See Extended Table of Contents) ..... 1

### ORIGINAL ARTICLES

Clinical Aspects of Amebiasis. *Samuel E. Munson, M. D., Springfield, Ill.*..... 21  
Laboratory Methods in Diagnosis of Amebiasis. *Bertha Kaplan Spector, Ph. D., Chicago*..... 25  
Medical Management of Amebiasis. *Arthur E. Mahle, M. D., Chicago*..... 33  
Surgery in Amebiasis. *Gatewood, M. D., Chicago*. 41  
Allergy of the Eye, Ear, Nose and Throat. *Leon Unger, M. D., Chicago*..... 47

Surgery of the Gall-Bladder and Bile Tract. *Charles B. Puestow, M. D., Chicago*..... 54  
Recrudescence of Malaria. *Tom Kirkwood, M. D., Lawrenceville, Ill.*..... 58  
Various Activities of the Beating Heart. *Emmet Keating, M. D., Chicago*..... 63  
Comparative Values in Roentgenologic Examination of the Colon. *Cesare Gianturco, M. D., Urbana, Ill.*..... 67  
Management of Arthritis. *Roger T. Farley, M. D., Chicago*..... 74  
Principles of Radium Therapy in Malignancies. *Frank Edward Simpson, M. D., Chicago*..... 77  
Treatment of Gonorrhea. *Leon M. Beilin, M. D., Chicago*..... 85

(Continued on page 8)

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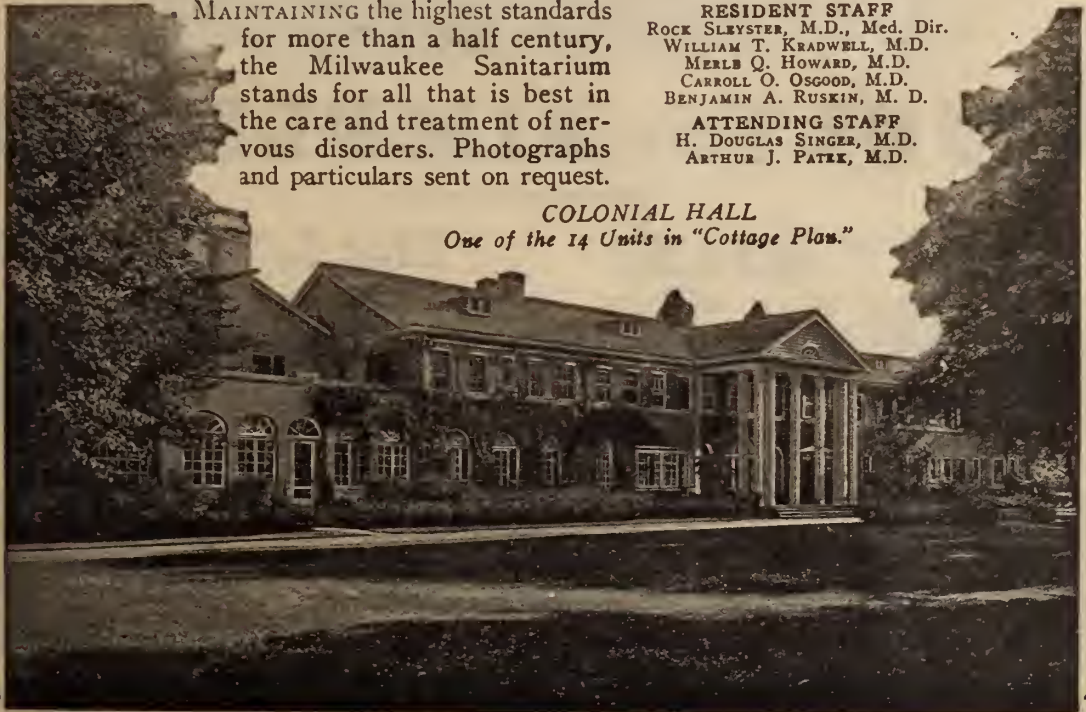
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(1) 1936 J. Nutrition 11, 55.

(2) 1936 J. Home Econ. 28, 18.  
1925 Ibid, 17, 265

(3) 1935 J. Home Econ. 27, 376  
(4) 1917 Amer. J. Dis. Child, 14, 34

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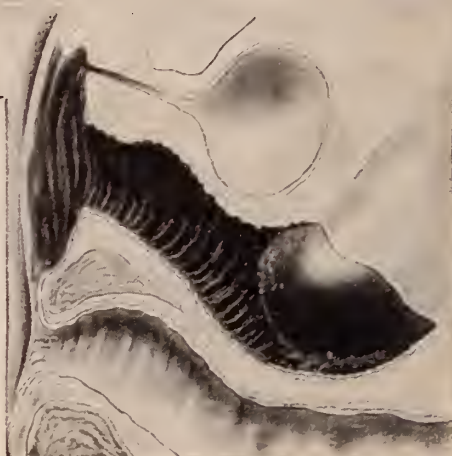
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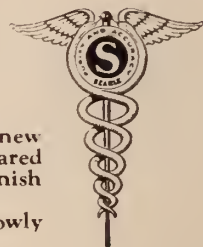
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## CONTENTS—Continued

### EDITORIALS

Happy New Year.....	1
Anti-Syphilis Crusade .....	2
Compulsory Health Insurance.....	3
New Light on Health Insurance.....	4
Medical Economics. E. S. Hamilton.....	8
Medical Service for the Poor. John R. Neal.....	9
Problems of Medical Practice. E. P. Coleman.....	12
Don't Grumble .....	14
Club Dues vs. Medical Society Dues.....	13
Papers for Annual Meeting.....	14
Treatment for Epilepsy.....	14

### CORRESPONDENCE

Communication to Members of Legislature.....	15
Inversion of the Uterus. O. H. Crist.....	15
A Little Sample. A. R. Reder.....	16
Educational Committee .....	16
Woman's Auxiliary .....	18
Binder for the Journal.....	19
Book Review. Dr. Caldwell's Daily Log.....	19

### SOCIETY PROCEEDINGS

Cook County-Chicago Medical Society.....	88
Greene County .....	88
Kankakee County .....	88
Marriages .....	89
Personals .....	89
News Notes .....	89
Deaths .....	91

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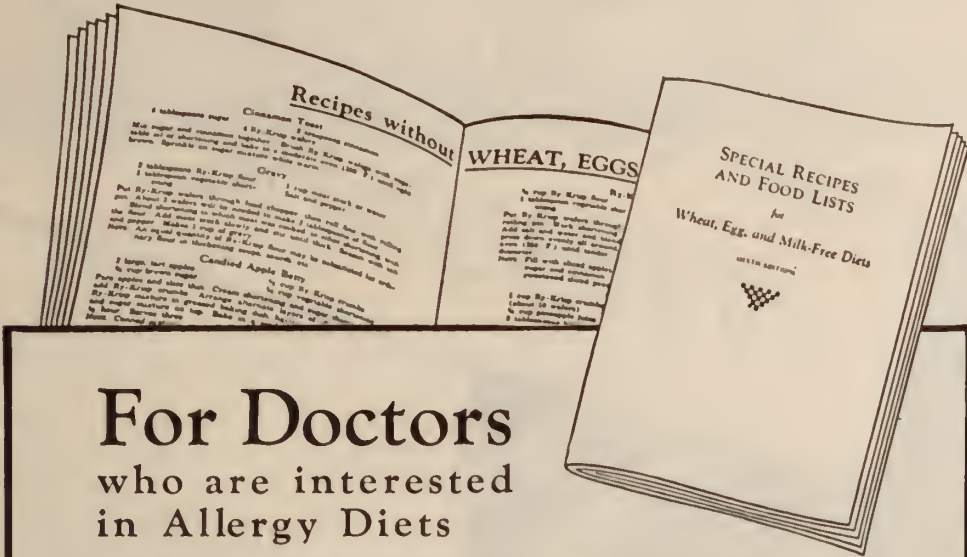
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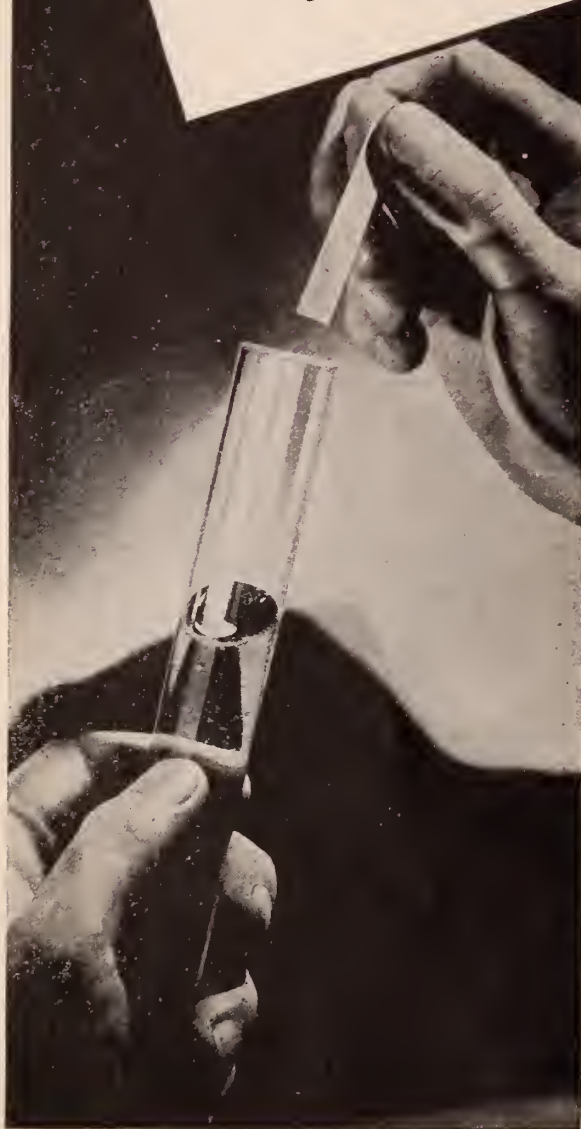
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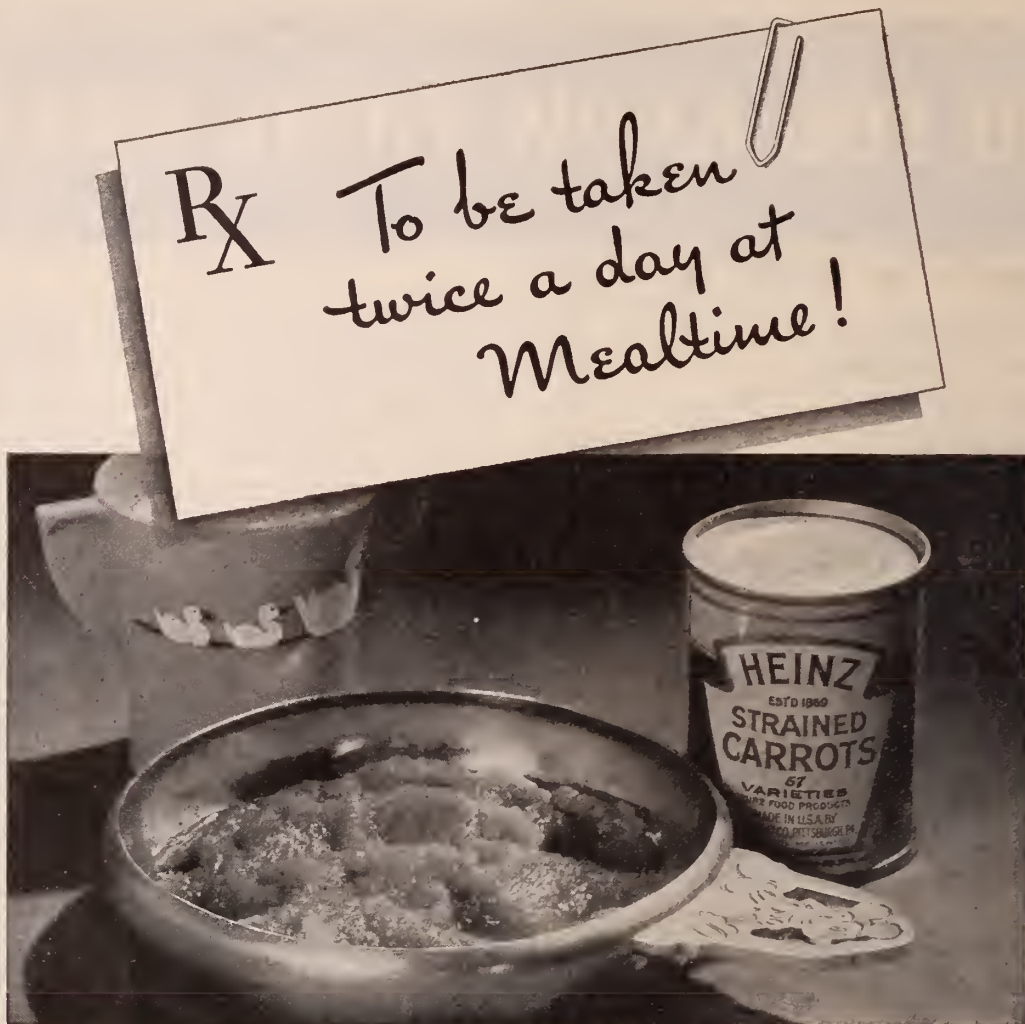
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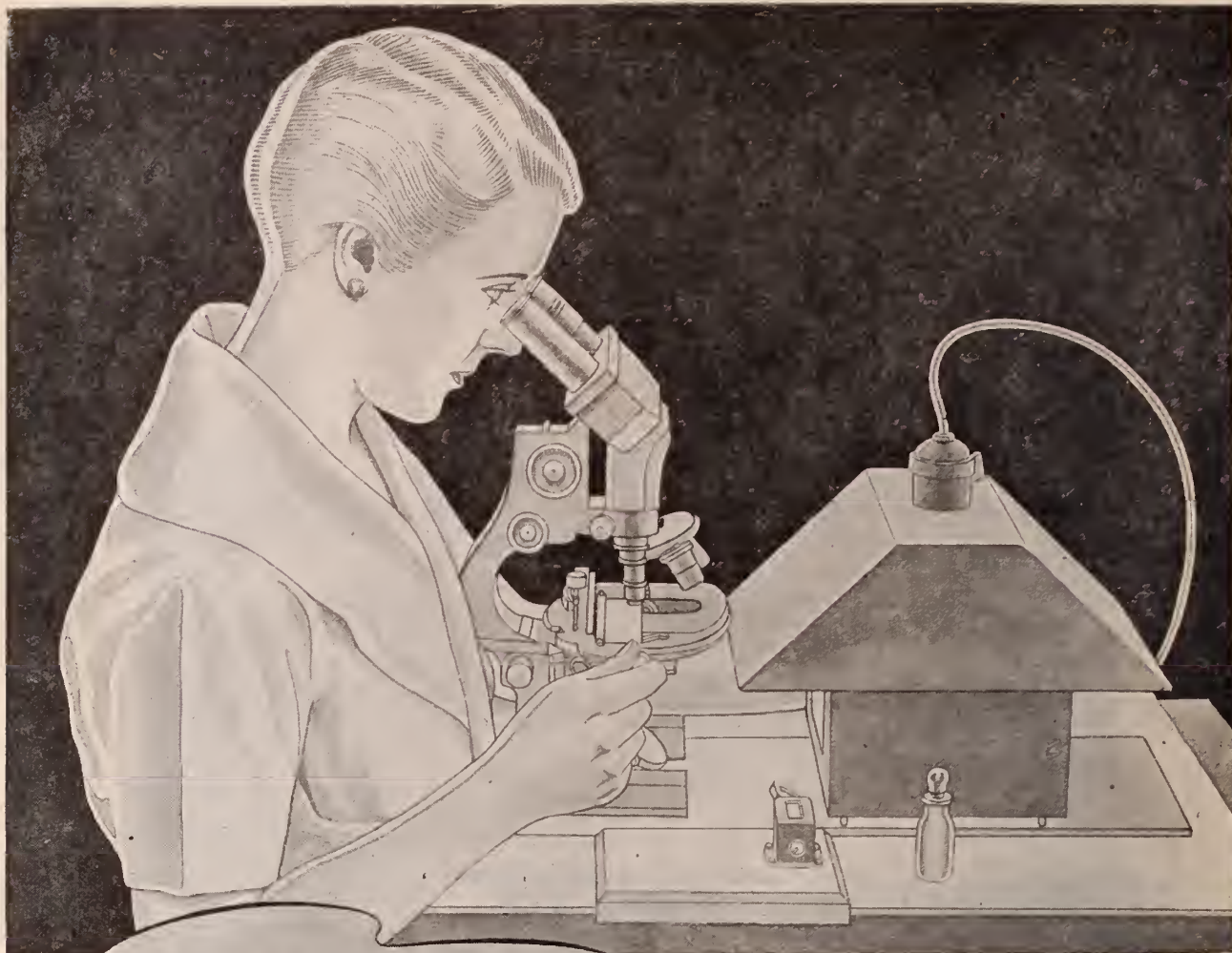
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VOL. 71

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T. B. Knox, 6th District, Quincy .....1939  
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## Editorials

### HAPPY NEW YEAR!

The phrase is as old as the calendar and as trite as trouble, yet through the centuries the recurrence of its utterance has been a spark to kindle anew in the hearts of men, the fires of hope!

Hope, illusory though it may prove, is one of the major factors of life. To the medical profession hope is a fundamental asset. Early in our years of service we learn that we must keep up the *hope* of the patient, the *hope* of his family and of his friends, and last but not least, our own faith in the ultimate betterance of what is bad and the further development of what is good. In our more mature and in our later years, this fundamental essence of *hope* inevitably proves to be one of the most precious compounds in any dispensary.

Which is why, to the medical man, this annual message of "Happy New Year" means a great deal more than gold embossed letters and a red and white greeting card. To doctors this phrase signifies a renewal of faith in the minds and the methods of men. To the doctor at large the phrase is a reminder that what is before us *must* be better than that which has been left behind. The Fifth Verse of the 146th Psalm cites those "Whose hope is in the Lord." The doctor must have not only faith in the Lord, but in himself and in all things mundane.

We believe firmly that this will be a "Happy New Year" for the medical profession, and the foundation for this belief is the indubitable awakening of the profession to the fact that doctors can not live by science and service alone but that due respect for the *economics* of the profession is a necessary fundamental. This awakening, this realization of the tricks that have been played by a misguided public upon the profession is that conception of an existing situation for which these editorial columns have besought its readers for several decades. That this understanding is coming about, slowly but surely, is



basis for knowledge that the coming twelvemonth will make for greater felicity in the ranks of the profession.

It is cheering to know that the profession has turned the x-ray upon all such invidious forms of socialism as "State" medicine, whether it be masked as "health insurance" or by some other mocking masque. Thus informed there is no doubt but that no matter from what Parnassian heights these false and radical doctrines may be cast like Jovian thunderbolts to destroy all that is best in Medicine, and all that is best in Americanism, the profession is perfectly capable and perfectly determined to set up enough lightning-rods to deflect these socialist instruments of chaos.

So for those ideals of medicine that keep in the heart of the profession the ideals, rather than the illusions of hope, let it be written again,

"A Happy New Year."

### ANTI-SYPHILIS CRUSADE SPURTS INTO YEAR END ACTIVITY

As we go to press, lay newspapers and journals all over the land, are filled with the doings of the first session of the three-day conference "to open a nation wide war against the dread twin scourges of syphilis and gonorrhea" as the *Chicago Tribune* (Monday, Dec. 28, 1936) phrases the movement.

The conference, called by Surgeon General of the United States Public Health Service, is said in these same press dispatches to draw its delegates from "noted gynecologists, *health experts and social service leaders.*"

It is to be noted that *family physicians were not thought worthy of mention*—even if any of that busy group were able to find time to attend. As in smallpox, tuberculosis, typhus or typhoid fevers, scarlet fever, or cholera, in questions of community prophylaxis, the public health service, whether municipal or national can be of utmost assistance to *medical control of the plague.*

According to a statement attributed to The Surgeon General of The Public Health Service the purpose of the conference is to "encourage discussion of the venereal disease problem in open forum" and that "already medical, *nursing, lay and church groups have subscribed to the fight.*"

Venereal disease is one of the tragic problems

of any nation. Ravages of such affliction "even to the fourth generation," is one of the greatest of physical calamities met with in medical practice. Dr. William F. Snow, general director of the American Hygiene Association, had prepared a set of figures for "the conference" in which he stated that "about 6,000,000 men, women and children in the United States are infected with syphilis. Yet not one in ten of this number is under treatment by a licensed physician. The amount of gonorrhea is twice as great. At least 26,000 persons die in this country every year from syphilis."

Further figures presented were that the incidence of syphilis is two to one as compared to tuberculosis and 100 to one as compared to infantile paralysis and that it is estimated cases of syphilis and gonorrhea during 1936 in the United States totalled 19,000,000.

Mexico has also spurred up on its fight against syphilis. Six years ago the League of Nations found Mexico the third highest in infant mortality—always a disputable figure since Mexican records are so laxly kept it might as well rank first.

Authorities claim that the infant mortality in Mexico account for something like 23% of the total death rate. Dr. Salvador Gonzalez Herrejon, medical savant of Mexico, asserts that 14% of the entire population is suffering from venereal disease and that in Mexico City itself at least 50% of the population is thus afflicted!

At the recent "Congress against Crime" held in Mexico City the point was raised that "transmission of venereal disease shall be considered a crime." So far this point has not yet become either a Mexican law or statute.

Mexico admits failure to regulate prostitution or to control venereal disease by licensing or protecting prostitution. Oddly enough the Mexican and the United States anti-venereal campaigns seem to have sprung into fresh growth at about the same time. The question is, since the law has failed to stop prostitution, as it failed to check inebriety and as it fails to stamp out gambling, how far will any law be effective against venereal disease? This would appear to be a medical problem.

The effect of a little knowledge about that sort of thing when distributed to the general public may be gleaned by perusing this excerpt from the able column maintained daily in *The Chi-*



*cago Tribune* and edited by Dr. Irving S. Cutter under the title "How to Keep Well." This clipping is taken from Dr. Cutter's column in the edition of Monday, December 28, 1936, and reads:

#### NOT DANGEROUS

"G. W. writes: Will you settle an argument that comes up frequently in my family and perhaps avoid a tragedy? Unfortunately, some years ago I contracted syphilis. After considerable treatment I became negative and have had Wassermann and Kahn tests every six months since. I even had a spinal test which was also negative. I have a boy 21 years old and he does not bathe, eat, or shave at home on account of my having had the disease. He has had four blood tests taken, all of which were negative. I claim there is no danger to any member of my family, at this stage, but my son thinks otherwise.

#### REPLY

"You have long since passed the infective stage and since you are wise enough to hold yourself under medical observation, there is no possible way in which you can be dangerous to others. The numerous negative tests are proof positive."

### PROPAGANDA FOR COMPULSORY HEALTH INSURANCE IS BOTH ELUCIDATIVE AND ALARMING

An insight into methods of "build-up" to incite a so-called "popular demand" for health insurance is revealed by a recent poignant editorial in *The New York Medical Week*.

At the request of the Public Relations Bureau of The Medical Society of the State of New York this editorial is herewith reprinted. Entitled "Health Insurance Propaganda," its comparative citations of recent "loaded" comment favorable to this communistic, un-American measure are both elucidative and alarming.

The long-suffering American people has been subjected to much forcible feeding of socialistic propaganda. Of all such messes offered this of "health insurance" that brings no *health* in its wake, and of an insurance that does not insure, is by far the most nauseous. It not only behooves every ethical physician to study the facts set forth but to spread their indubitable truth as far as lies within his personal powers.

There are clever brains behind this cooked-up communistic pottage that is being prepared for the American people in lieu of their birthright of scientific care. The misfortune is that while cleverness and wisdom may seem to be slightly akin in reality they are as far apart as the poles themselves.

Read every line, doctor, of this editorial headed "Health Insurance Propaganda."

#### HEALTH INSURANCE PROPAGANDA

On Monday, November 23, 1936, a newspaper of the city, the *New York Herald Tribune*, gave its columns over to a piece of propaganda which deserves attention. Under date of November 22, 1936, and presumably coming from Washington, a feature article is written, headed "Health Insurance Study Is Instituted by Security Board."

Like all propaganda, the "news-spread" necessarily must be tacked to some event and so this time we find it tacked to some casual recommendations made by Harry Hopkins, WPA Administrator, in a speech to the United States Conference of Mayors last Tuesday; and incidentally also it is tacked to a report of the Executive Counsel of the American Federation of Labor. Then, not giving either the speech made by Mr. Hopkins or the substance of the report of the Executive Counsel of the American Federation of Labor, the propagandist in question hides his identity under the statement, "A spokesman for the Social Security Board." For the rest of a column and a half of ordinary newspaper space there is nothing but argument and propaganda, and little or no factual news. In the end the reader is left to wonder *who* is advocating health insurance, who is putting forth the arguments for it, who says that it is to be considered purely as a tax measure, and who is it that is forcing attention to it and arousing argument.

The stress presented in the newspaper broadcast consists primarily in the fact that existing systems of unemployment compensation and old age benefits "are generally believed in Security Board circles as measures to bring health insurance to the fore" and "almost all European countries have comprehensive plans of health insurance providing cash benefits in disability and invalidity and supplying medical aid." The plea ends with the statement that it can be conducted on a pay-as-you-go plan.

In the September 1st issue of the *New York State Journal of Medicine* editorial note was made of the "lull before the storm." An ominous silence was noticed on the part of the protagonists for health insurance. We were then aware that the protagonists of health insurance had not quit. We rather resent the fact, however, that *government agencies* should engage in propaganda to create a demand for something which the public has neither asked for nor needs.

The news release also announces that more time to study the proposition is asked. We seriously recommend that it be studied; that comparison be made of

the morbidity and mortality statistics abroad with those here; that the uses which are made of preventive medicine abroad with that here be taken into account. We could go on at length but of what avail to argue with those whose minds are made up. What can one expect from Walton Hale Hamilton, the economist head of the research division, a former member of the National Industrial Recovery Board! We know him through a different activity. He was one of those who, under Ray Lyman Wilbur, brought out the report of the Committee on the Costs of Medical Care which recommended health insurance; and he wrote his own special report on this thesis, which in itself was but an elucidation of the preconceived object of the committee, from the pen of its director, Harry H. Moore.

President Roosevelt has announced that there will be no measures proposed calling for the necessity of adding to our present heavy tax burden. Furthermore the President, in his address in Jersey City, gave the profession assurances that it would be consulted, and its wishes given attention when changes affecting medical practice came under consideration. Our conception of consultation and consideration does not envisage government spokesmen speaking for their preconceived ideas, long fixed, of how medical practice shall be arranged.

It has been jocularly said that the many governmental functionaries who speak publicly for the administration have so managed things that the Washington administration can take more sides on any given question than is possible of geometrical demonstration. In this question of medical care, at least, let us have plain, straight thinking and speaking. There should be but one side to the problem. How to provide the highest possible *quality* of medical care to those of the public that need it, and to make provision that financial barriers shall not stop those needing it from getting it.

### A NEW LIGHT ON HEALTH INSURANCE AGITATION

Some six or seven weeks ago one of the greatest of the world's newspapers (*The New York Herald-Tribune*) printed a news dispatch from Washington, D. C., that had all the earmarks of a hit-below-the-belt at the medical profession.

As doughtily as if they were their own ancestors out chasing Hessian troops, members of the New York Medical Society, headed by their president, the fearless Floyd S. Winslow, took up the fight. When the history of this decade of medical economies is written, the three documents we reprint herewith will be, quite beyond argument, instruments of importance.

Their very significance earns them space here. In order these are

1. Washington dispatch by Albert L. Warner, "Health Insurance Study Is Initiated by Secur-

ity Board," printed under date of November 23, 1936.

2. Letter entitled "Compulsory Sickness Insurance," written by Floyd S. Winslow, Rochester, N. Y., president Medical Society of the State of New York, and printed on editorial page of *New York Herald-Tribune* under date of November 24, 1936.

3. Editorial, "Nationalized Medicine," in *New York Herald-Tribune* under date of December 1, 1936.

These reprints will all bear the closest scrutiny.

### HEALTH INSURANCE STUDY IS INITIATED BY SECURITY BOARD

EXPERTS DIRECTED TO LEARN COST OF MEDICAL SERVICE  
AND CASH FOR TIME LOST OFF JOB  
THROUGH ILLNESS

TAXES SEEN AS ONLY FINANCING METHOD

ROOSEVELT PROMISE OF NO NEW LEVIES MAY FORCE  
DELAY OF PLAN FOR YEAR, EVEN IF IT  
IS APPROVED

By Albert L. Warner

Washington, Nov. 22.—The Social Security Board has initiated a study looking to possible proposal of a major addition to the social security system in the shape of health insurance, it was disclosed today.

As large a Federal project for social welfare as either unemployment insurance or the old-age benefit insurance system, health insurance would provide both medical services and cash payments in partial compensation of wage losses due to illness. Should legislation for this purpose be sponsored, it would probably be of the same universal type as the old-age benefits. The coverage would extend to most of the working population of the nation and taxes would be required to finance it.

#### EARLY PROPOSAL DELAYED

An official proposal considered two years ago, but postponed, contemplated establishment by the Federal government of minimum standards for health insurance practice and provision of grants or other incentives to states undertaking the development of systems meeting the Federal standards. The fact is cited that nearly every large industrial country of the world has applied the principle of insurance to the risks of illness.

The new study is in line with recommendations made by Harry Hopkins, WPA Administrator, in a speech to the United States Conference of Mayors last Tuesday and the report of the executive council of the American Federation of Labor.

A spokesman for the Social Security Board said that the board had drawn no bill on the subject and had



made no commitment as to sponsoring the new line of insurance. Invoking the authority of Section 702 of the social security act, however, the board has directed that a research study of the subject be made and experts are starting work in this connection, it was stated. In view of the promise of President Roosevelt to avoid new taxes at the coming session of Congress, it is possible the Social Security Board might temporarily withhold pressing the health insurance proposal even if it should decide to recommend favorable action on the basis of the projected studies.

#### COST ESTIMATE IS HIGH

Comprehensive health insurance has been estimated as likely to cost the equivalent of more than 5 per cent of pay rolls. The President's committee on economic security in January, 1935, prepared a tentative plan, but recommended further studies. It found that the cost of wage-loss payments would be 1 to 1¼ per cent of pay roll. It estimated that families with up to \$3,000 earnings a year are spending 1½ per cent now of their income for medical care. Under existing social security legislation the unemployment insurance tax will run to 3 per cent of pay rolls, payable by the employer, and the old age benefits will cost 6 per cent, shared equally by employers and employees. State and Federal money, however, is already being raised and spent for a certain amount of medical care which would be covered in the service offered by health insurance. It is held improbable that any recommendation would contemplate raising all the cost of health insurance from pay roll taxes.

The Security Board's study will be under the general direction of Walton Hale Hamilton, economical head of the research division and former member of the National Industrial Recovery Board. The authorization in Section 702 directs the board to study and recommend "the most effective methods of providing economic security through social insurance and as to legislation and matters of administrative policy concerning old-age pensions, unemployment compensation, accident compensation and related subjects."

Existing systems of unemployment compensation and old-age benefits are generally believed in Security Board circles as sure to bring health insurance to the fore. The present unemployment compensation scheme compensates unemployment due to lack of work, but does not compensate unemployment due to inability of wageearner to work because of illness. In practice it is anticipated that it may be quite difficult to draw the line between these two types of unemployment, and that the present scheme will tend to compensate wage-earners for disability under the guise of unemployment.

Similarly, the old age benefit plan will bring up the question of what is to be done for the worker who, before reaching the age of sixty-five becomes permanently disabled, it is pointed out. Under the present plan a worker at forty-five who became permanently disabled would receive no benefits until he became eligible for old age benefits at sixty-five.

Almost all European countries have comprehensive

plans of health insurance providing cash benefits in disability and invalidity and supplying medical aid. The cost of these plans is usually shared by three parties: the employer, the employee and the state.

Unlike unemployment compensation and old age benefits, health insurance requires the building up of no large reserve, officials say. The plan can be placed on a pay-as-you-go basis, each year's cost being met out of that year's receipts. Also, unlike the other two insurance plans already established, the insured worker under health insurance gets benefits from the start. He does not have to wait until the next depression or until he reaches old age. Accordingly, it is believed there is less difficulty in the collection of the taxes or contributions than in these other forms of insurance.

#### COMPULSORY SICKNESS INSURANCE

*To the New York Herald Tribune:*

As president of the Medical Society of the State of New York, please permit me to comment on the item appearing on the front page of your issue of November 23, under the headline: "Health Insurance Study Is Initiated by Security Board."

The article describes the European scheme of so-called "health insurance" better called "sickness tax." The writer, Albert L. Warner, presents a typical case for collectivist medicine, bureaucratically controlled, which the medical profession, almost as a unit, opposes for the reason that in every country where it has been tried it has resulted in a deterioration of the quality of medical care which the public receives.

\* \* \*

Your correspondent states: "Almost all European countries have comprehensive plans of health insurance providing cash benefits in disability and invalidity and supplying medical aid. The cost of these plans is usually shared by three parties: the employer, the employee and the state."

This is a correct statement. But the public should know that in these countries the economic status of the industrial worker, before sickness insurance legislation, was so low that he could barely gain enough food for himself and his family, to say nothing of providing medical care. In England, a radio or a car is beyond the dreams of the industrial worker. Bismarck in Germany and Lloyd George in England, put forth this scheme as a sop to socialism, and its result has been to fasten a gigantic pay roll of stenographers, clerks, "economic advisers" and what not on the backs of the laboring people, in exchange for a type of medical care which has been described as "a pat on the back, a stock prescription, and out the door."

What do well informed Europeans say about compulsory sickness insurance?

\* \* \*

Sir Frederick Treves says: "The English working class has a craving for bottles of medicine which is second to the craving for strong drink."

Many physicians are required to see forty to sixty patients a day—some average 100. This is far too many. Why do not British doctors complain? It should be remembered that health insurance has existed as a

part of the government in England since 1911. British physicians who see its great defects are "cagey" in their public statements derogatory of a system on which so many physicians and bureaucrats are dependent. Yet Sir E. Farquhar Buzzard, in his presidential address before the British Medical Association, said: "Any medical service which aims at the prevention and early detection of disease, to say nothing of the preservation of health, must provide the doctor with ample time to carry out his work, and I have no hesitation in adding the better educated the doctor the more time he will require."

\* \* \*

"The chief flaw in a badly organized service, such as that which has evolved in this country during the last century, is lack of time, and both the general practitioner and the consultant, in order to earn a living wage, are frequently obliged to undertake far more work than they can deal with efficiently in the hours at their disposal."

Regarding the system in Austria, I quote Dr. Jacob L. Moreno, director of research, New York Training School for Girls, Hudson, N. Y.:

"No physician is capable of properly treating the large number of patients sent him under sickness insurance. He is forced to evolve some mass production plan of operating his office to run people through his mill as fast as possible. The 'rush' system of handling patients is inevitable. When the technique of getting them in and out fast is perfected, the doctor begins to lose that intangible 'something' which is vital to both himself and his patients—his morale. I do not know any doctor who remained long at this sort of practice in Austria who did not become hardened."

Regarding Germany, Dr. Paul G. Frank, a German physician at present in this country, says: "For almost thirty years I have worked as a German panel doctor under the conditions of compulsory health insurance, and for many years I was a member of the physicians' committee. During this period I witnessed a deterioration of the medical profession. It came about by the removal of the sanctions of preferment by skill and the substitution of preferment by convenience."

\* \* \*

"What I mean is that an insurance scheme soon becomes a business—it must do so to succeed, while the practice of medicine must be a profession to succeed at its best, and the two will not mix. In Germany the physician who was most adaptable to the advancement of the plans of the insurance officials, and who most pleased the patient for reasons perhaps quite other than skill, obtained the most rapid preferment."

Some of the most high-minded and altruistic of American physicians deplore the propaganda being disseminated in behalf of this unworkable system. William J. Mayo says: "We of the medical profession are determined that we will not be subjected to political interference. We will not sacrifice the spiritual values of our profession for the small material gains held out to us by political and social experimenters who are attempting now to control the practice of medicine. We

refuse to be dictated to by men who are not physicians, who do not understand the sacred obligation of physicians to their patients."

\* \* \*

Security for the doctor means insecurity for the patient. Advocates of these measures lure the profession with the siren song of bureaucratic jobs, assured income—security—false security. We do not want to be secure. We want to remain insecure. We prefer the discipline of private practice which keeps us on our toes to an assured income under bureaucratic control where our highest ambition is more likely to be to keep ourselves solid with the politicians who have taken over the job of running our profession.

The physicians of the country would approve such a widespread plan for medical care if there were a reasonable hope, based on experience, that it would work. As a profession, our first interest is the interest of the patient. It is needless for me to say that in our daily work it is our constant effort, to render our services unnecessary—we are a group of men constantly trying to work ourselves out of employment. If sickness insurance were anything better than a palliative to "kid" the people into thinking they are getting something for nothing, the medical profession would be the first to support it. If there were, in fact, any worthy evidence that the health of the people had been improved in any country adopting this scheme, we would be willing at least to try it in America.

\* \* \*

What is the evidence on this point?

The health section of the League of Nations has compiled statistics on the general death rate of all reporting countries, covering the period from 1911 to 1934. Six countries, in 1934, had a death rate from all causes of less than ten a thousand. Think about that for a minute, and what it means! A very fine record, is it not? These countries were the Union of South Africa, Australia, Canada, New Zealand, Norway and the Netherlands. Four of these six, the Union of South Africa, Australia, Canada and New Zealand, do not have compulsory health insurance!

According to these same League of Nations statistics, our death rate in 1934 stood at eleven a thousand; right behind the leaders. You must remember that this includes the Southern states, with a Negro population not found in any European country. If you leave out these Southern states and consider only that part of our country in comparable geographic location to the European countries with compulsory health-insurance systems, we would have a lower death rate than that of any insured country!

\* \* \*

Nearer home are other countries whose vital statistics are on file with the League of Nations. One South American country—Chile—has compulsory insurance. Its death rate in 1934 was 26.8. Compare this with the rate of 11.8 in Argentina and 10 in Uruguay, neither of which countries has an insurance system!

Are the American people to be misled by social theorists into saddling themselves with a system that



works like this? I am sure they will not if they are informed of such facts as are submitted here.

Floyd S. Winslow, M. D.,  
President Medical Society of the State of New York,  
Rochester, N. Y., Nov. 23, 1936.

### NATIONALIZED MEDICINE

The Social Security Board let it be known in Washington a few days ago that it had authorized a study of health insurance on a nation-wide scale as a corollary to unemployment insurance. The board has made no commitment in favor of a Federal system of health insurance and has yet to consider what form such legislation might take.

The letter which appeared on this page recently from Dr. Floyd S. Winslow, president of the New York State Medical Society, opposing warmly such a system heralds a storm of criticism which will burst upon Washington if legislative support of such a program is ever sought. For, with rare exceptions, every medical association or society, national, state or county, in the United States, continues to be uncompromisingly hostile to "socialized medicine."

Yet certain conditions exist in this country which argue for a much wider distribution of medical services than now exists. In some quarters they seem to argue for heavier subsidies from public funds for public health work. Most of these conditions and needs are, we believe, recognized by organized medicine. In rough outline they are as follows: There is a big element in the population either needy, ignorant and reckless of health or with low earning power but a real pride that gets much less medical attention than it should. Aside from all humanitarian considerations, this is a matter for grave public concern. Those persons disabled by neglected injuries or illnesses are likely to become permanent and expensive burdens on private charity or public funds. They also incubate sickness to the detriment of the public health. Next, there are more well trained and competent doctors and nurses in the United States than can earn a fair return on their investments in education and training. This makes the cost of medical attention to those of average income, who want medical care and want to pay for it, discouragingly high.

Faced with these conditions, all those persons who would rather have the government take any difficult problem off their minds and solve it expensively and inefficiently than think and work it out for themselves clamor at once for compulsory health insurance under Federal control. Accepting such propaganda as a challenge, the medical organizations become so bitterly (if justly) critical of every compulsory insurance scheme—and are so much on the defensive—that they appear in their publications to be taking a let-well-enough-alone attitude. Against "socialized medicine" in every form that has been tried abroad, they argue from abundant data that it constitutes an enormous tax burden, that it lowers the quality of medical care for all, that it does not improve public health and that it forfeits through perfunctory, impersonal treatment the confi-

dence of those very elements in the population which it is designed to benefit.

These objections, when examined in detail, are enough to line up the average conservative American layman behind the medical profession in its hostility to compulsory insurance. But mere hostility is not enough. The gap in medical care must be studied and a sound remedy devised. Otherwise the "socializer," who has the bit in his teeth, will prevail. To save the medical profession and the nation from the affliction of another European institution, about as well suited to our temper as peace-time conscription, it seems to us that the doctors will have to consider forthwith how medical, nursing and hospital service can be rapidly extended in conformity with the public interest and with their professional ideals.

### OPERATIVE TREATMENT OF STERILITY IN THE MALE

Francis R. Hagner, Washington, D. C. (Journal A. M. A., Dec. 5, 1936), believes that the most frequent cause of sterility in the male is inflammatory occlusion of the epididymis or vas deferens and limits his remarks to its treatment. The endeavor to overcome the occlusion by an anastomosis of the vas deferens and the globus major offers the only chance of recovery. The author has never had a successful case following operation for sterility in which the patient has not had a history of bilateral epididymitis. There are two conditions that must be present for a successful result in sterility of this type: first, the vas must be patulous above the point of the anastomosis; second, the globus major, or the upper portion of the body of the epididymis, must contain live spermatozoa. A failure at one time, if live spermatozoa are present and if the vas is patulous, is not a contraindication to a second operation. In some of his most successful results he has had a failure the first time, with a favorable outcome at the second operation. The time of the appearance of the spermatozoa varies. Reoperation is not recommended before a year has passed. Nearly all the author's operations have been done by lateral anastomosis, except for a few rather atypical ones, and success has been obtained only in those cases in which silver wire was used as a suture. The operation, while tedious, is not dangerous to life. General anesthesia should be used. In order to avoid the formation of scar tissue no local infiltration should be used. The operation cannot compromise the function of an organ that has already proved functionless.

### ARGUMENT FOR HEALTH INSURANCE THE INSIDE DOPE

Foreman (to small son of workman who has met with an accident)—When will your dad be fit for work again?

Boy—Can't say for certain, but it won't be for a long time.

Foreman—What makes you think that?

Boy—'Cause compensation's set in.—Montreal Star.

## MEDICAL ECONOMICS

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Kankakee, Illinois

H. M. Camp, M. D.  
R. L. Green, M. D.  
I. H. Neece  
R. K. Packard, M. D.  
C. B. Reed, M. D.  
C. S. Skaggs, M. D.

Address all letters and communications to the Chairman.

Every man is most interested in that phase of his work which particularly appeals to him. This is especially true of medical men. Those of us, who have given special thought to the broad subject of medical economics, are greatly heartened by the attention being given this subject all over the country. The recent statement of Dr. Thomas Parran, Surgeon General of the United States Health Service, voicing his opposition to Compulsory Health Insurance was most pleasing. Coming at a time when he is endeavoring to interest the medical men of the United States in the battle for the control of syphilis, it shows that he appreciated the source of the support necessary to carry this battle to a successful culmination. We must assume that he is sincere in his statement. He is well known in Illinois and his friends insist that he has always been dependable and honest. The assistance of men such as Dr. Parran will be great when the final decision is to be made by those in high positions of authority and power.

The Secretary of the Illinois State Medical Society will attend a special meeting of the Public Health Service, to be held in Washington, to consider the manner of conducting the campaign against syphilis. Dr. Camp will be one of seven delegates from the state of Illinois. He should return in time to report at the next meeting of the Council in Peoria, early in January. At that time the Council should be able to arrive at a definite decision as to the stand of the Illinois State Medical Society. Surely the least the medical profession can do is to approve the work and to cooperate if possible.

The Chairman of this Committee with Dr. Wilkinson, who has given particular attention to this subject for several years, attended a special meeting of the Council of the Chicago Medical Society where the subject of the recently formed Group Hospitalization Plan was discussed. There

still remains a great difference of opinion among the doctors and no definite decision was arrived at. The presentation of the plan by the incorporators, made up almost entirely of non-medical men, was made and they were able to answer all questions asked. They seemed honest and sincere and made a good impression on those present. One left the meeting with the feeling that regardless of any action by organized medicine, the plan would be put in operation in the near future. Recent articles in the lay press have substantiated this opinion. Without the medical profession actively participating in the operation of the plan, one must admit the probable dangers which lurk therein, as the plan develops and becomes more inclusive. As we have mentioned many times before, it is unfortunate that the medical profession does not lead in the planning of such work and so often is merely either ignored or called in after the plans are all made. We should be the leaders and not silent followers in all things involving the health of the community. Both Dr. Wilkinson and the chairman wish to thank the officers of the Chicago Medical Society for the invitation to attend the meeting.

The New York Medical Society continues its fight against State Medicine by using publicity in a manner which should be studied by all state medical societies. It is very fortunate that such a key state as New York has such able, militant leadership. Practically every newspaper in the state carries articles at regular intervals under the supervision and sponsorship of the local county medical society. In addition they carry paid articles, in which the people are informed on health subjects and the opinion of the medical profession as to changes needed and proposed. Naturally, they influence both the laity and the legislators. These latter are most important, for they must have definite information if they are to vote intelligently at the next meet-



ing of the legislature to be held in 1937, when important medical legislation is to be considered.

It has recently come to the attention of the Committee, that one of the provisions of the Social Security Law, provides for the formation of either county or district health boards. These are to be made up of one physician, two engineers, one nurse and one social worker. The medical profession should give some thought as to whether such a set-up meets with their approval, so that they can advise the legislature of their desires in the matter, when they meet in January to consider new legislation on this subject. Without complete understanding of the plan and the manner in which it will be administered, it is impossible to arrive at the proper decision and be able to advise the lawmakers.

The ever present question of the care of the indigent has received further study at the hands of a Committee, headed by Dr. John Neal of Springfield. They have a report ready at this time and it will follow this article in this column. It should be read by every man in active practice in Illinois. You will note that the office of County and Township physician is gradually being done away with although there are still fifteen counties in the state, where a contract physician is still employed. We must evolve a uniform plan for the state, doing away with all contract physicians and giving the sick free choice of physicians. A second article, directly following that of Dr. Neal is from the pen of Dr. E. P. Coleman of Canton. He presents "Recent Problems Confronting the Medical Profession" in a manner which will stimulate your interest and make you do some thinking. Take time to read both of these articles.

E. S. Hamilton, M. D.,  
Chairman of Committee.

## MEDICAL SERVICE FOR THE POOR

Report on a Survey in Illinois

JOHN R. NEAL, M. D.,

Chairman Committee on Indigent Medical Care

Lack of uniformity in policy or plan is the most impressive feature of the methods now employed in providing medical services to the poor in Illinois. Indeed, it may be said that, by and large, neither the organized medical profession nor the constituted political authorities have adopted any well-defined policy or developed any clear-cut program of caring for the

indigent sick. While organized medicine unanimously favors the principle of guaranteeing to the poor their choice of physicians, some form of contract medicine with respect to the indigent prevails in fifteen counties.

These features are outstanding in the findings of a study recently completed by the Illinois State Medical Society. The information was collected on forms sent out by the Secretary of the State Society to the Secretary of each county society. Returns were received from 80 counties. Definite policies and plans with respect to procedures and fees which have been discussed and approved by the medical societies and the county boards, prevail in only 21 counties among those submitting schedules.

The legal machinery as well as the traditional attitude of physicians are both factors in the present situation. According to law, the financial responsibility of providing medical care for the poor rests upon the township except in the 17 counties with the commission form of government, where it devolves upon the county. For this reason the county boards, except for the 17, have no legal authority for setting up a county-wide system of medical care for the indigent. Physicians, on the other hand, have from ancient times, accepted the responsibility of taking care of the poor among their clientele without compensation. This practice has tended to smother interest on the part of many physicians in developing systems of medical service for the poor which involve definite fee schedules and compensation.

Changes in the social order which have created a large population of unemployed, on the one hand, and a demand for more extensive medical services for the financially disabled, on the other, have created a new problem that defies solution by former methods. The volume of medical care required by the poor is too great for the medical profession to carry gratuitously. It is, moreover, a public responsibility, devolving upon other members of society no less than upon physicians.

The time seems ripe, therefore, for the development of policies and plans that will meet the situation as satisfactorily as may be, and which can be adopted uniformly throughout the State. The survey was the first step on the part of the Illinois State Medical Society toward this end.

The study disclosed that contract medicine,

with respect to the poor, prevails to some degree in 15 counties. In most cases the contract is limited to one or a few townships. In Sangamon County, for example, Capitol Township employs a physician at \$4,000 per year to provide medical care to the indigent. This physician also has an agreement on a reduced fee basis to take care of the poor from two other townships. In Henry County a similar method prevails, Kewanee Township employing a physicians at \$650 per year who also collects \$50 per year from a contiguous township. Macon County pays \$200 per month to a physician who agrees to do all necessary medical work for the poor. Among the fifteen counties in this category the contract physician undertakes to provide medical care for all indigents in each of 7 counties while his services are limited to one or more townships up to about three in 8 other counties.

Schedules returned by the secretaries of the county medical societies show that this system is the least satisfactory of all to the profession. It denies to patients the choice of physician, on the one hand, and usually places on one doctor so much work that he cannot possibly give a satisfactorily high standard of medical care to the patients. It introduces the element of bargaining into a contract which tends to give preference of employment to physicians of secondary professional ability or to those with political strength.

The counties in which one or more townships employ physicians on a contract basis include the following:

Clinton	Morgan
Henry	Peoria
Iroquois	Sangamon
Kane	Shelby
Knox	Wabash
McHenry	Warren
McLean	Will
Macon	Grundy
Montgomery	

The Kankakee County plan is unique in Illinois. All financial matters are arranged between the County Medical Society and the County Board of Supervisors. At the present time the Society collects \$75.00 per month from the Board in return for providing ordinary medical service for the poor. Surgical and obstetrical services are paid for in addition to this regular monthly stipend. The Society uses this income to defray membership fees and to provide library and other facilities for its members. Medical

services are provided by the members on a rotating plan. This system appears to be operating satisfactorily to all concerned.

In twenty other counties the medical societies and the county boards have arrived at mutual agreements which establish on a county basis a definite policy, uniform maximum fees, a choice of physicians in most instances, and systematic procedures in providing medical care for the poor. The plans followed, however, vary considerably from county to county. In Champaign County, for example, the Society members who wish to participate, are organized into teams of 5 which serve on a rotating schedule over a period of six weeks, and the work is done at the County Hospital on a specified fee basis, paid for by the County Board. This limits somewhat the free choice of physicians by patients but appears to operate satisfactorily.

In Henderson County, on the other hand, the patient initiates the procedure by making contact with the physician of his choice. The doctor then makes contact with the supervisor of the township in which the patient lives, and this supervisor takes the matter up with two other supervisors, making a committee of three. If this committee accepts the responsibility, the physician is notified and performs the service at the expense of the county. If the work is done prior to authorization by the committee, the doctor's bill is not allowed. Although a schedule of fees was drawn up by the Society, bills are usually discounted to the extent of 40 or 50 per cent.

In other counties of this group, the practice varies in detail. Supervisors in some instances influence the choice of physicians by requiring patients to apply first to the supervisor and make contact with physicians only upon his recommendation and authorization. Through this method, a good deal of surgical work is diverted from DuPage County to free clinics in Chicago. Fee schedules range from 50 to 100 per cent of regular fees but collections are not always complete. A reasonable degree of satisfaction among the medical profession prevails in the twenty-one counties where mutual agreements between the Societies and the County Boards have been effected. While from a legal standpoint administration is based upon township units, counties have accepted responsibility through action of



the Board which is representative of all townships.

Counties where mutual agreements prevail include the following:

Adams	Jersey
Alexander	Johnson
Boone	Kankakee
Champaign	Lee
Clark	Mariou
Coles-Cumberland	Massac
DeKalb	Ogle
DuPage	Vermillion
Henderson	Woodford
Jackson	? unidentified schedule

No county-wide plan has been adopted in any of a group of 39 counties. These operate on a township basis. The medical societies in ten of these counties have made unsuccessful efforts to establish county plans. Little or no effort in this direction appears to have been exerted by the medical profession in the other counties. In all 39, however, there has developed a general understanding with respect to fees, although full payment is not always forthcoming. Generally the I. E. R. C. schedule has carried over without direct action on the part of either the medical profession or the political authorities. Methods of approach varied widely where efforts to establish a definite understanding were made. In Greene County, for example, the medical profession simply declared that the emergency had terminated and wrote a letter to that effect to each supervisor. This letter, which was signed by each member of the medical profession proclaimed an end of reduced fees, but set up a schedule somewhat lower than regular fees. It has not been ratified by the supervisors, however, and the 50 per cent fees of the I. E. R. C. still prevail. A committee from the Pike County Society met with a committee from the Board and agreed upon a plan and schedule but it was not accepted by the Board. In Winnebago County a committee from the Society met with the Board and agreed to continue under the I. E. R. C. plan. However, all hospitalized indigents go to the County Hospital which maintains a closed staff. This often cuts off the physician of choice and creates dissatisfaction to some degree.

Most of the counties in this category have made no attempt to establish a definite system of providing medical care to the poor. "We, as a Society," says the secretary of the Edwards Society, "just told them (County Board) that every physician would take care of cases coming to him." Bills are presented to the overseer of

the poor for approval and if accepted, presented to the County Commission for payment. In LaSalle County there is "no definite plan. Doctors in each community make agreements with the supervisor." Edgar County has "no society plan." Patients apply to supervisor who executes an order that authorizes the physicians of choice to provide necessary services at the expense of the county.

In only two counties of this category, Fulton and Livingston, are patients denied entirely the right to select their own physicians. The supervisors make the choice in those. In four others, Christian, Madison, Pike and Tazewell, some of the supervisors specify the physicians whom patients must employ.

The 39 counties which have no definite agreement with the county boards, but which operate on a fairly well established schedule under township administration include the following:

Bureau	Lawrence
Carroll	Livingston
Cass	Logan
Christian	McDonough
Clay	Macoupin
DeWitt	Madison
Douglas	Mason
Edgar	Menard
Edwards	Pike
Effingham	Pulaski
Franklin	St. Clair
Fulton	Saline
Gallatin	Schuyler
Greene	Stephenson
Hancock	Tazewell
Hardin	White
Jasper	Whiteside
Jersey	Williamson
JoDaviess	Winnebago
LaSalle	

Four counties, Randolph, Richland, Washington and Wayne, appear to have no plan of any kind. In Randolph County the "burden since discontinuance of former relief plan falls upon individual physicians," while in Richland there is "no understanding between county board of supervisors and physicians of county in regard to indigents' medical care. Only acute surgical cases come to the attention of physicians and remuneration is provided only when hospital contacts supervisor." Except for inhabitants of the jail and county farm, indigents go from one doctor to another in Washington County, while in Wayne County the doctors "accept what is offered and chew the rag" in return for services provided for the poor.

The Rock Island County Medical Society has considered the problem of medical relief very

carefully. A definite plan and fee schedule has been worked out on a fifty per cent. reduction basis with maximum aggregate amounts specified for individual physicians. Free choice of physicians is stipulated. This plan has been submitted to the County Board but not yet adopted.

The survey discloses two outstanding features with respect to providing medical care for the poor. One is that contract medicine or any other method which denies to the patient a free choice of physician is always unsatisfactory and usually results in a low quality of medical service. The other is that a definite plan based upon an established policy agreed upon by the organized medical profession and the political authorities produces the most satisfactory results for all concerned.

Contract medicine still prevails to some degree in fifteen counties while the lack of uniformity in policy and plans leaves much to be desired throughout the State.

Committee on the Care of the Indigent.

Dr. John R. Neal, *Chairman*,

Springfield, Illinois.

Dr. E. S. Hamilton, Kankakee.

Dr. E. P. Coleman, Canton.

Dr. Chas. B. Reed, Chicago.

Dr. I. H. Neece, Decatur.

Dr. Chas. S. Skaggs, East St. Louis.

Dr. C. E. Wilkinson, Danville.

Dr. Chas. H. Phifer, Chicago.

Dr. H. M. Camp, Monmouth.

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## RECENT PROBLEMS CONFRONTING MEDICAL PRACTICE

The most casual examination of some recent magazine and newspaper articles indicates that physicians are going to be compelled to devote more time and thought to their own economic interests. The threat of compulsory health insurance and the associated danger of socialization of the practice of medicine is appearing as an ever increasing menace to us all. We, as doctors who have studied the comparative superior type of medical care afforded to the people of this country, as contrasted with the relative inefficiency of that obtained in European countries where health insurance under State domination has caused so much expense and dissatisfaction, realize that there is no need for such experimentation here. Our present task is to continue our

efforts to educate the public to this realization.

A campaign has been started recently to convey to the public the erroneous idea that at least two health problems have been beyond the control of scientific medicine. The public has been accustomed to receiving such uniformly good medical service that it tends to believe any stories with a medical problem without trying to analyze the accuracy of such information. Especially so when published in an otherwise reliable paper. It is now being informed that one in ten is a victim of syphilis. The general idea conveyed seems to be that most of the victims have acquired the disease innocently and that they are unable to obtain adequate treatment because of the high cost of such treatment and the financial inability of these innocent victims. We know that these ideas are untrue, but while we should be ready to cooperate in every way to help lessen the incidence of this disease and to do all in our power to eradicate it, we should also notify the public of these facts. That, due in fact to the free arsenicals furnished by the State Department of Health, this disease can be treated successfully, and the expense kept within the means of any of its victims, innocent or otherwise. That the average doctor is not seeing any tremendous increase in venereal diseases in his own practice and that the State insane asylums are filled with cases of dementia praecox, rather than with paresis or any other manifestation of syphilis. This to correct the general impression the neuro-syphilis provides 95 per cent. of the asylum population in the State. That while the present incidence of syphilis is all too high, it is due to the moral standards of the present generation and not to any inability on the part of the patient to receive treatment.

The public is also being told that there is an excessively high maternal death rate in this country. A number of doctors who apparently must obtain their medical information from daily papers and popular magazine writers, rather than from scientific journals, have echoed this statement. Women's Clubs are being assigned the duty of lowering this rate and again the implication is that there is a lack of medical care for expectant mothers. It is stated that it is unsafe for a woman to be confined in a general hospital because these places are said to reek with infection. One might as well say that it is unsafe for a patient with pulmonary tuberculosis to be in



a sanatorium for treatment, because so many people with this disease die in sanatoria.

We as a profession need to correct these mis-statements and to a limited degree this can be done in the following ways. We must notify the public of the facts that the foreign maternal mortality reports, exclude many conditions that are included in our reports from Washington. They should be given to realize that our records include such things as criminal and self-induced abortion, deaths due to heart disease in pregnant women, etc. It might even be well for them to know that some of the excellent results in some maternity centers are due in part to the fact that some obstetrical cases treated in the outpatient department have been denied admission to the main hospital when puerperal sepsis developed and have been cared for in general hospitals near by, with a more liberal policy. Those who died lowered the average for the general hospital but the paper record of the special hospital was of course kept unimpaired. Yet the general hospital staff was doing its duty in attempting to help the patient who was not its original responsibility.

Information should be given to the public in as many ways as possible, by presenting our ideas before the usual sources, such as luncheon clubs, women's organizations, men's clubs, etc. In order to disseminate this information more extensively, it might be possible at times to have such addresses prepared in advance in newspaper form and delivered to the local papers on the day the address is given so that the publisher can use it if he sees fit while it is still recent news. When this can be done, a talk that is heard by a few dozen at most, can be put in the hands of several thousand with very little added effort.

So long as half truths or untruths are being given to the public, our best defense is to tell our patients the exact facts and to be willing to cooperate and to lead in any public drive to improve health conditions in our communities.

In many communities, throughout the State, the problem of medical care for the indigent has been made difficult due to the fact that each supervisor has his own ideas as to what constitutes such care. He would much rather spend his township funds grading roads past the farms of the heavier taxpayers, than to put it to the much less spectacular purpose of treating a few indigent sick. In a few places where it seemed

impossible for the supervisors and the County Medical Societies to get together, a fee schedule was arranged by the Society with a rate low enough to satisfy any fair minded supervisor and mailed to each one on the Board of Supervisors. The result has been that many of the men who would not agree with the Medical Society as a group, are now letting their indigents select the physician of their choice and making payments according to this schedule. Further contacts along this line, especially through the medium of the family physician may enable us to avoid the worst abuses of the pre-relief relief system where an overworked country doctor cared for some of the indigents for an insufficient sum, and his colleagues did the bulk of the work for nothing; all this while every other pauper need was being paid for at regular rates.

A county pauper fee bill may be an unfortunate necessity but it is an improvement over the old method formerly in vogue. A unified county society can help with many of the economic problems of its members, and be of great aid in preventing an unwarranted invasion of the field by non-medical people.

E. P. Coleman, Canton, Ill.,  
Councilor, 4th District.

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#### CLUB DUES VERSUS MEDICAL SOCIETY DUES

Ever and anon a complaint is received in regard to medical society membership dues. As a rule the complaining member is a member in name only, he attends his county and state meetings on rare occasions and is possessed of little information as to what is being done in defense of his profession or to prevent outside encroachment on his practice and livelihood. By non-attendance he neglects opportunities to improve his professional ability and standards of practice.

When questioned it is found that the complainant is a member of several clubs and lay social organization. He pays from \$75 to \$150 for the privilege of playing golf. Dues of \$60 to \$125 are paid for admission to a club where he can pay 85 cents to \$1.25 for his noon lunch, an hour of bridge, billiards or checks, and say "Howdy" to the banker, lawyer or merchant Pooh Bah of his town. He readily remits \$50 to \$100 per year to some luncheon club where he



can sing the "old songs," be called Jack, and listen for thirty minutes to some imported speaker describe how a can is made in six operations from one small piece of tin. Then there is the lodge, church, fishing or skeet club, and possibly one or two other lay organizations. All told, his nonmedical organizations tap him for from \$200 to \$400 for yearly dues. His medical society dues average from \$20 to \$50 per year the average being about \$25 per year.

Criticism is not directed against membership in these organizations, provided income permits. Criticism is directed against such membership when complaint is made, "we are paying too much for what we get." That claim is challenged because facts exist to disprove that statement. The trouble is that this member has never taken the pains to ascertain or acquire the full benefits of membership in his county medical society. He can secure the facts by reading the editorials and Association activities columns in the preceding twelve issues of *California and Western Medicine*. For value received a physician obtains more from his medical dues than he obtains from his dues paid to nonmedical organizations. The value of returns is so great and membership benefits so vital that an eligible physician cannot afford *not* to be a member.—*California and Western Medicine*.

### DON'T GRUMBLE ABOUT YOUR MEDICAL SOCIETY DUES

*New York State Journal of Medicine* is authority for the following:

#### TO GRUMBLERS

Doctors who think their medical society dues are high are told by the *New York Medical Week* to cast a glance at the dues of \$20 in the County Lawyers Association, of \$75 in the Bar Association, of \$30 in the Plumbers Union (with \$200 initiation fee), and \$64 in the Electrical Workers (with \$100 initiation). Instead of being high, "the county society dues are low—too low, in fact, to sustain the ever-expanding duties which organized medicine must assume. . . ." Many spheres of influence are closed to the profession because its official organizations have not the funds for active participation in important movements."

### DOCTORS WISHING TO PRESENT PAPERS AT THE ANNUAL MEETING OF THE STATE SOCIETY

The officers of the Section on Medicine of the Illinois State Medical Society are now preparing the program for the forthcoming session at Peoria in May of 1937. Any member of the Society wishing to present a paper may send the same or a satisfactory abstract thereof to the officers of the Section as promptly as possible. It is desired that the program should be completed by the 15th of February. Members from Cook County may send papers or abstracts to Dr. James G. Carr, 30 North Michigan Avenue, while members from other parts of the State will please send their abstracts or papers to Dr. Cecil M. Jack, Decatur, Ill.

### A PROMISING TREATMENT FOR EPILEPSY

Orpheus E. Wright, M. D., Winston-Salem, N. C., in the November issue of *Southern Medicine & Surgery* reports a case of Idiopathic Epilepsy treated by the usual course of Antirabic Vaccine.

We quote in part: "In April, 1935, while in the City Laboratory, I heard a man who had brought in a dog's head for examination for possible hydrophobia infection telling the technician that since he took the hydrophobia vaccine five years ago, he had not had a single epileptic attack. He related that he formerly had been subject to typical and frequent seizures of the most severe grand mal type; on account of this that he could not retain a steady job; and that, five years ago, he had been exposed to hydrophobia and had been given the standard treatment of vaccine, since which time he has had no seizure.

"Realizing that the anti-rabies vaccine is made from the desiccated spinal cord of the rabbit and that epilepsy is a disease of the central nervous system, I wondered if probably the sequence of events in this case might be cause and effect rather than happenings connected in point of time only. I resolved, therefore, to submit the case to the patient whom I had been treating.

"The patient was willing to try out its merits, so I gave him the full course of 21 injections just under the skin of the lower abdomen, in April and May, 1936. *Up until the present he has not had another seizure.* His general health has shown marked improvement, much of the

apathetic disposition and the moron-like conversation has disappeared. He has put in a full summer's work on a farm and is an entirely different individual.

## Correspondence

### COMMUNICATION SENT TO ALL MEMBERS OF THE STATE LEGISLATURE

The Illinois State Medical Society wishes to express to you its profound interest in any and all proposed legislation of a medical character that may come up for consideration in the forthcoming session of the General Assembly and to ask for an audience on such matters before you commit yourself to measures in this field. Many bills relating to the practice of medicine, the licensure of various cults, vivi-section, health insurance, the requirement that teachers and others obtain health certificates, and to sundry other matters bearing upon medical affairs will undoubtedly be introduced.

A fair and judicious appraisal of these bills, so that legislative action may result in public benefit rather than advantage to selfish interests and sentimental enthusiasm, will require a comprehensive conception of the possibilities and limitations of scientific medicine and the social implications involved. Representing more than 10,000 physicians whose training, experience and observation in the treatment of human ailments and in the protection of health, the Illinois State Medical Society is in a better position than any other agency to express sound, valid, scientific opinions on the practicable character of proposed legislation affecting medicine and health. It requests the opportunity of being heard on such matters.

The Illinois State Medical Society believes that the door to practice medicine should be open wide to every person who meets the legal qualifications for licensure, but that these requirements should be high enough to protect the public against incompetence and fraud. It believes that the best possible medical care should be provided to every citizen who needs it but that the system of practice should be sound economically and socially. It believes that the future holds out the promise of greater scientific medical progress than has been achieved in the past and that competent research workers should

not be handicapped by unreasonable legal restrictions. It believes in an adequate, efficient public health service but that the State should not undertake the practice of medicine.

The Society has confidence in your good judgment. It believes that merit in proposed legislation will be the deciding factor in your position on bills. It understands the limitations on your time and energy at Springfield. For these reasons the Society has never and does not propose in the future to maintain or bring to Springfield organized bands of lobbyists or to impose upon you a flood of telegrams from an "alarmed" public or sentimental communications from "grateful" patients. We believe that you will appreciate this attitude.

Our request is simply that you maintain an open mind on legislative proposals relating to medicine and health until you have considered the evidence that may be presented by a competent representative of the medical profession.

This course has been pursued by the members of the General Assembly in the past. As a result, Illinois enjoys a standard of medical service unsurpassed by any State in the Union. The public and individual health conditions in this State are second to none. The medical profession is proud of this record and hopes to maintain it.

The State Medical Society will appreciate the opportunity of cooperating with you to this end.

Very truly yours,

J. R. NEAL, M. D.  
Chairman Legislative Committee,  
Illinois State Medical Society.

### INVERSION OF THE UTERUS

*To the Editor:*

Inversion of the uterus is unusual enough to make the following interesting:

Miss T. C., age 24 years, primipara; last menstrual period on Nov. 25, 1935; expected time of labor, Sept. 2, 1936. Gestation period was uneventful. Diagnosis of breech presentation was made in the office before labor.

She was a heavy, strong, healthy girl. Pelvic measurements were normal. At 6 a. m. on September 2, the membranes ruptured. She entered St. Elizabeth Hospital and was observed throughout the day. Active labor started at 6 p. m. At 8 p. m. she was given 2 capsules of seconal and



at 9 p. m. 3 capsules,  $4\frac{1}{2}$  grs. nembutal; at 9:20 p. m. she was given ether in oil with paraldehyd, per rectum. She was well relieved of pain. Dilation was complete at 10:20 p. m. At 10:30 p. m. she was put in stirrups and prepared for delivery by breech extraction. She was given 2 minims pituitrin and a little ether for the delivery. She had an episiotomy. The extraction was not difficult. The babe weighed  $1\frac{1}{2}$  lbs.,  $11\frac{1}{4}$  oz. The third stage was 12 minutes.

The uterus was not felt very definitely on account of a heavy abdomen. Moderate pressure on the uterus and slight traction of the cord, delivered, what was supposedly, the placenta. Instead, at this time it was noticed that the uterus with the placenta attached had inverted through the vagina and well through the vulva. This condition was recognized immediately. The patient was in stirrups and under anesthesia. The placenta was detached and the funds was grasped firmly and gradually replaced through the cervix into the abdomen. This replacement was felt distinctly by internal as well as external hand. The uterus was replaced without difficulty, probably within 2 minutes after its inversion. There was apparently no shock and hemorrhage was not at all severe. The cervix could be felt perfectly intact. The uterus was not packed. The episiotomy wound was repaired in the regular way after which the cervix was again examined and found normal.

The patient's convalescence was entirely normal. Her highest temperature was  $99^{\circ}$ ; pulse ranged from 80 to 96 during the next few days. She left the Hospital on September 12, 10 days after delivery, which is our routine in normal cases. Examination on Oct. 23, 1936, seven weeks past partem showed the uterus and cervix exactly as would be expected following normal labor.

I am reporting this case on account of the rarity of this condition and I hope it will be of interest to obstetricians.

O. H. CRIST, Danville, Ill.

#### A MORAL TO JUST A LITTLE SAMPLE

An innocent little sample was left on the desk of my friend Doctor. The sample was a medical one left by a leading pharmaceutical house—for cough.

A patient came in, the Doctor was very busy, he had no time to examine and prescribe for this coughing patient, so handed the sample to the patient and dismissed her. The sample did the work and so the patient passed the label to her neighbor and this little label netted—51 refills and the result—the druggist got his, but the Doctor got nothing and further deprived other Doctors of a good fee. There is a moral to "just a little sample," for 1937.

DR. A. R. REDER.

#### EDUCATIONAL COMMITTEE

##### *Report for December*

#### SCIENTIFIC SERVICE:

County medical societies find helpful the service of the Committee in supplying scientific programs, as indicated by the following speakers scheduled during the month:

DuPage County—Dr. Clark W. Finnerud—"Diagnosis and Treatment of Common Skin Diseases."

Will-Grundy—Dr. Horace Stimson.

Perry County—Dr. O. P. J. Falk of St. Louis—"The Cardio-Vascular Complications in Diabetes."

Perry County—Dr. E. V. Mastin of St. Louis—"Surgical Handling of the Thyrotoxic Patient."

Bureau County—Dr. Harry Mock—"Skull Fractures."

Will-Grundy—Dr. C. J. Barborka.

Northeastern Indiana Academy of Medicine—Dr. Eugene F. Traut—"Chronic Arthritis: Its Causes, Prognosis and Treatment."

Jo Daviess County—Dr. Roswell T. Pettit—"Cancer of the Breast."

Livingston County—Dr. Don C. Sutton—"The Old Myocardio Case with Reference to Treatment and Diagnosis."

Livingston County—Dr. James T. Case—"Some Phases of Colonic Diagnosis."

Winnebago County—Dr. Edward Lyman Cornell—"Some of the Newer Developments in Obstetrics."

Winnebago County—Miss Anita Jones of the New York Maternity Center—"The Nurses Part in Maternal Care."

Franklin County—Dr. Dudley Smith of St. Louis—"Treatment of Gonorrhea in the Female."

Franklin County—Dr. Rogers Deakin of St. Louis—"Treatment of Gonorrhea in the Male."

#### SPEAKERS BUREAU:

30 Physicians were scheduled to present popular health talks before the following groups:

Boys and Girls of Marcy Center, Chicago—Dr. I. Tre-gier.

Staunton Woman's Club—Dr. A. F. Kaeser.

Boys Chicago Community Center—Dr. Harry M. Hedge.

Girls Chicago Community Center—Dr. Alice Conklin.



Edward Hines Hospital Nursing Staff Dr. P. A. Teschner.

Park Manor Woman's Club—Dr. Alex S. Hershfield.

Maywood Woman's Club—Dr. W. O. Thompson.

Brainerd Woman's Club—Dr. Frank G. Murphy.

Central Y. M. C. A.—Nine programs.

Wilmington High School Boys—Dr. Donald Killinger.

Y. M. C. A. Hotel, Chicago—Dr. Howard Wakefield.

First Methodist Church, Evanston—Dr. P. A. Teschner.

Crystal Lake Woman's Club—Dr. E. H. Weld.

Darwin Parent Teacher Association—Dr. I. H. Tun-  
peer.

Itasca Woman's Club—Dr. M. M. Kunde.

District High School P. T. A. Conference—Dr. Leo  
Mayer, Dr. Robert H. Hayes, Dr. George K. Fenn.

Wilson Avenue Y. M. C. A.—Dr. Cleveland J. White.

Lewis-Champlin Parent Teacher Association—Dr. A.  
C. Rambar.

Clearing Woman's Club—Dr. S. C. Kehl.

Graeme Stewart P. T. A.—Dr. M. P. Borovsky.

Park Manor Congregational Men's Club—Dr. R. K.  
Packard.

Kankakee Rotary Club—Dr. Guy Cushing.

Reports from chairmen of these programs are inter-  
esting:

"Very much enjoyed."

"This was the first program of this type that we  
have had and everyone enjoyed it immensely."

"Very satisfactory and well liked by the boys."

"Interesting material, well presented. Everyone was  
pleased with this talk."

"Was enjoyed by all. Was ethical and that means  
much."

"Excellent speaker. Covered his subject thoroughly.  
Appreciative remarks by those attending."

"Very good talk and enjoyed by the club very much.  
Individual congratulations of program numerous and  
made front page of local paper."

The requests for speakers continue to come in. Only  
clubs that can guarantee an audience of fifty are being  
supplied with speakers and if funds are available we  
have not been hesitant in urging them to pay the ex-  
penses of the speaker and a small honorarium.

We could take care of more requests from cities  
down state and hope that doctors belonging to serv-  
ice clubs will try to arrange programs through the  
Committee office.

The great amount of publicity being given to Vener-  
eal Diseases is creating interest and requests for talks  
on these subjects are increasing.

Dr. Normal L. Sheehe, Department Surgeon of the  
American Legion, has written the Committee:

"Thank you for the health talk topics you sent me  
and for the assistance offered by your Committee in  
regard to them. I am sure they would prove advan-  
tageous and I intend to send out a bulletin to the vari-  
ous Posts throughout the State asking them to formu-  
late such a program in their year's work. The talks  
would not only be instructive but would make for the  
best of harmony between the two groups which would  
prove advantageous all around."

## RADIO:

20 Radio programs were given on the following sub-  
jects:

Parent and Child Relationship.

Defects in Children's Eyes.

Respiration.

Round table discussion on the Handicapped Child by 3  
pediatricians.

The Common Cold.

School Health Inventory.

Rheumatic Fever.

Infections of the Fingers and Hands.

Medical Christmas Gifts.

All Is Not Gold That Glitters.

Contagious Diseases in Children.

Significance of Ear Noises.

Headache.

Convalescent Care of Anterior Poliomyelitis.  
Inventory Time.

Epilepsy and Convulsive States.

The Hygiene of Pregnancy.

The Obstructed or Blocked Nose.

X-Rays and Health.

Common Colds Prevalent.

A few weeks ago a letter was received in the office  
of the Committee from F. A. Davis Company, Medical  
Publishers of Philadelphia, which stated:

"We are interested in the problems of Preventive  
Medicine as Applied to Public Health.

"To my desk have come news items regarding the  
many broadcasts given on this subject by accredited  
medical associations. As editor for one of the oldest  
and most ethical medical publishers, it is our business  
to know adequately all new developments in the medi-  
cal field. In communicating with Dr. W. W. Bauer of  
the American Medical Association, he suggested your  
Association as one which has been doing most excel-  
lent work in this field.

"Therefore, I write to you with the hope that we  
may be placed on your mailing list to receive a copy  
of future broadcasts."

Copies of some of the broadcasts were sent to the  
Davis Company, after conversation with Dr. Teschner  
who is Dr. Bauer's assistant. A letter then came from  
the Company as follows:

"Thank you for your letter of December 3rd and its  
most interesting material. Certainly, the Illinois Med-  
ical Association is to be congratulated on its extensive  
use of radio as a means of communication in Preven-  
tive Medicine and the indications that newspapers as  
well as radio are lending valuable assistance to such  
important work.

"As you supposed, I am interested in your additional  
activities. Apparently your Society has been unusually  
successful in supplying the Health News for newspa-  
pers at a time when authentic and wise material in  
such mediums is needed greatly.

"I shall be very much interested in the extent to  
which this activity has been carried, the names of the  
papers cooperating, etc. We often have questions con-  
cerning present successful methods in such a field."

## NEWSPAPER SERVICE:

538—Press articles to Illinois newspapers—many releases on subjects such as colds, influenza, pneumonia, sinus trouble, etc.

396—Health articles to public libraries in the state.

108—Health articles to Health Chairmen and Home Advisers.

5—Notices to Chicago papers of Chicago Medical meetings.

Material prepared for the Illinois Federation of Women's Clubs:

100—Radio talks mimeographed.

100—Letters for Health Chairmen mimeographed.

## MISCELLANEOUS:

The Chicago Rotary Club and the Chicago Chamber of Commerce are carrying on an experiment in Vocational Guidance for a selected group of fifty young men of the North Park College. Panel discussions have been held by prominent manufacturers of Chicago, the Chicago Bar Association, the Retail Merchants Association, and others. The medical society was invited to participate by planning a panel discussion of "Vocational Outlook for Youth in Medicine." Doctor Ferguson and Miss McArthur met with Mr. Nelson of the Rotary Club who is chairman of the experiment, and with Dr. Thomas P. Foley, President of the Chicago Medical Society. The general plan was arranged and Doctor Foley will carry on with the project and it is hoped that the discussion will take place in the Cook County Hospital Amphitheater early in January with the various phases of medicine being presented by Doctors Morris Fishbein, Irving S. Cutter, David J. Davis and Thomas P. Foley.

The Marshall Field & Company Annex window display has attracted considerable attention not only from Illinois Citizens but we have had comments from Nebraska and New York City.

The December window carried out the idea that "Christmas Gifts for Children Should Include Immunization against Contagious Disease" and displayed a report showing the number of people in quarantine during the 1935 Christmas holidays.

It is hoped that the exhibits can be made suitable for other windows throughout the state. The Secretary of the Sangamon County Medical Society has asked to have the use of the material after it is removed from the Marshall Field window.

## PARENT TEACHER ASSOCIATIONS:

The Summer Round-Up Chairman for the Illinois Congress of Parents and Teachers has promised to send to the Educational Committee office a list of the schools registering for the Summer Round-up campaigns next spring. County medical societies will be notified of the schools in their counties where such work is contemplated. Lay chairmen will be urged to consult with the proper medical representatives before making plans to have examinations so that the local doctors can offer guidance and determine the *method* of examination.

## INFANT AND MATERNAL WELFARE IN THE STATE:

Doctor Ferguson and Miss McArthur met with a Committee interested in the Infant and Maternal Welfare program to be carried on in Illinois. This will be discussed by Doctor Ferguson at the Council meeting.

## BOARD OF EDUCATION CONFERENCE:

Doctor Ferguson and Miss McArthur were invited to attend a conference in the office of the Superintendent of the Chicago public schools, Representatives of the Chicago Medical Society, Dental and Ophthalmological Societies, the Chicago Health Department, were present together with others from the Illinois Congress of Parents and Teachers. The meeting resulted in an ultimatum by Dr. Johnson, Superintendent, that no health work or examinations should be undertaken in any of the Chicago schools until permission had been secured from him and after the program had been gone over by a committee he is organizing with representatives of the P. T. A., Chicago Dental, Chicago Health Department.

Respectfully submitted,

Jean McArthur, Secretary.

## WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

Without inspiration no group can successfully carry on to the goal set by past and present leaders. At the Board meeting held in Chicago in November such encouragement was given to all. Invitations were sent to County presidents to attend the session and also to have the privilege of hearing Mrs. Robert Fitzgerald, National President. Mrs. Fitzgerald stressed the dignity of our position in the community as doctors' wives and the opportunity it gave us to further the aims and ideals of "the most distinguished lay group in America." Three county presidents responded—Mrs. G. H. Mundt, Cook County; Mrs. H. L. Shafer, Livingston County, and Mrs. A. O. Sistler, Vermilion County.

As a part of their efforts to bring the profession before the public in a dignified manner, many counties are planning Laity Days. Two very successful ones were held in November—Cook County, with over a hundred in attendance, and Kane County, reporting over three hundred. In these meetings, women's clubs, P.T.A. and civic groups are represented, thus spreading the gospel of health to a vast number of people. Other activities of the Auxiliaries as a spur to greater effort:

Livingston County conducted their annual food shower for St. James Hospital, Pontiac, thus continuing the service ideal.

Bureau County plans an intensive study of women medics; in addition, they have arranged three parties to raise funds for the Bureau County Crippled Children's Clinic.

Will-Grundy County: purchasing books for the Auxiliary library from the approved list. They have had much pleasure and instruction in the speakers selected—Mrs. F. P. Hammond, State President; Dr. F.



J. Clancy, A.M.A. Bureau of Investigation, and Dr. Mary Schroeder, Elgin State Hospital. A Christmas shower for the Crippled Children's Clinic is an annual event and also subscribing to the Milk Fund. Noted speakers are the rule on all programs, as the following list shows:

Englewood Branch, Cook County—Drs. E. H. Hagens and H. Wm. Elghammer.

Central Branch, Cook County—Laity Day: Mrs. Robt. Fitzgerald, Natl. Pres.

North Shore Branch, Cook County—Irene Peyron, Major in Salvation Army; Mary D. Bailey, Assistant State's Attorney.

St. Clair County: entertained physicians; discussed Social Security articles from *Hygeia*, an interesting part of their programs. Secured Drs. C. S. Skaggs, V. P. Siegel, Mrs. F. P. Hammond and Mrs. H. B. Henkel, also sponsoring series of radio broadcasts.

McLean County: Dr. Hibler, Illinois State Normal University; Dr. J. Armour Lindsay, Superintendent Bloomington Schools; Dr. L. T. Fruin. It is possible that McLean County will have another Dr. Seymour. A son was born to Dr. and Mrs. Guy E. Seymour in November.

And so the work goes. A great variety of interests—as wide as the life of a physician of the world. To *Hygeia* Chairmen:

#### CASH PRIZES—CONTEST FOR HYGIEIA SUBSCRIPTIONS

The sum of \$150.00 will be given in cash prizes to the County Auxiliaries securing the largest number of subscriptions credits to *Hygeia* during the month of December and January. The \$150.00 will be divided as follows:

##### Group I

Auxiliaries with a membership 1 to 49...\$50.00 cash

##### Group II

Auxiliaries with a membership 500 to 199...\$50.00 cash

##### Group III

Auxiliaries with a membership 200 and over \$50.00 cash.

A new or renewal subscription will count as one credit; a two-year subscription as two credits; a six-month subscription as one-half credit. Each group prize awarded will be based on your quota and the number of subscriptions secured. Your quota is the number of paid-up members in your Auxiliary at the close of year 1935. This arrangement gives the Auxiliary with a small membership an equal chance with the larger ones.

The time of the contest covers period from Dec. 1, 1936, to Jan. 31, 1937. All orders post-marked on and previous to Jan. 31, 1937, will be counted in this contest.

The prize money in this contest is donated by Mrs. John O. McReynolds of Dallas, Texas, one of the past presidents of the Woman's Auxiliary to the American Medical Association.

County Presidents and *Hygeia* Chairmen: Your County has a chance to win one of these prizes of \$50.00 cash. We wish you success and sincerely hope you will start your local campaign immediately, if not already

under way. Your County has already been notified of this contest, with complete rules and instructions.

Mrs. V. M. Seron,  
State Chairman Press and Publicity.

#### A BINDER FOR THE ILLINOIS MEDICAL JOURNAL

It is now possible to secure beautiful and permanent binders for the ILLINOIS MEDICAL JOURNAL and other valuable magazines and at a very reasonable cost. Besides these can be bound in your own home or office in a few minutes thus saving the expense of shipping your magazines to a bindery. If you will write to The Suckert-Leaf Cover Company, 234 West Larned Street, Detroit, Michigan, they will be pleased to give you full details.

DR. COLWELL'S DAILY LOG PROPOSITIONS FOR PHYSICIANS. This is one of the most practical and simple systems of bookkeeping yet offered for physicians. It offers a bird's eye view of a medical man's daily financial condition. The "DAILY LOG" for physician is issued by Dr. John B. Colwell of Champaign, Illinois, published by the Colwell Publishing Company, Champaign, Illinois. This is the tenth edition of the "DAILY LOG."

For a number of years this volume has been a first aid to every busy doctor and his pocket book. Since first put out it has been subjected to yearly revisions and annotations though the general principal remains the same. "The Log" is just what its name says it is. Here is a daily financial record that is a brief, accurate, easily kept practical accounting system with daily, monthly and yearly totals, and monthly summaries and balances of income and expenses. It is *not* a ledger. To make a complete accounting system, a ledger must be run with it as the ledger is necessary for gathering together separate items of an individual account. However, this "Daily Log" is about the best thing that a busy man can have. It is easily kept by any intelligent office assistant and shows the physician the progress of his business day by day, and at the close of the year sets forth the basic figures needed for the income tax return.

Though not a clinical record there is a "Service Rendered" column for brief annotations of clinical facts.

The major changes in this 1937 edition of "The Log" are two new forms, one of these called "the Utility Record" is in answer to the demand by ear, nose and throat specialists and certain other specialists who have not found a proper form in "The Log" for particular records they wish to make. This "Utility" form is given with horizontal rulings only, and the individual doctor is expected to put in such other rulings as will make for him the form he wants. This form is found at the end of each month. The other form is our form for a record of Notifiable Diseases. Three pages are given to this form which is placed in the back of



the book immediately following the forms for the Obstetrical Records.

The "instructions for use" have been gone over carefully and revised to bring them up to date. On the inside of the heavy fly leaf in the back of the book we have listed the record blanks and physicians' supplies, which the Colwell Publishing Company has available for their use.

#### ROLE OF ALCOHOL IN CIRRHOSIS OF LIVER: CLINICAL AND PATHOLOGIC STUDY BASED ON 4,000 AUTOPSIES

Russell S. Boles and Jefferson H. Clark, Philadelphia (*Journal A. M. A.*, Oct. 10, 1936), states that in recent years there has been growing an increasing tendency to dispute the status of alcohol in the development of cirrhosis. It was with this in mind, especially, that the present investigation was undertaken. We wished to determine the incidence of cirrhosis of the liver, based on histologic evidence, as it occurred in a large general hospital—the ratio of age, sex and race, and, more specially, the relation borne to the disease by alcohol and the acute infections, and by syphilis, diabetes and tuberculosis. For this purpose 4,000 autopsies were studied. From an analysis of 4,000 consecutive autopsies performed at the Philadelphia General Hospital during the period from March, 1933, to July, 1935, they concluded that diabetes, syphilis, pulmonary tuberculosis and the acute infectious diseases, as well as such gross lesions in the digestive tract as ulcer, carcinoma and gall-bladder disease, do not bear any relation to the incidence of cirrhosis. It is further concluded that alcohol cannot be regarded as a specific factor in the etiology of cirrhosis. As the lesion defined as portal cirrhosis occurs under influences unassociated with alcohol, the authors would suggest abandonment of the term "alcoholic cirrhosis."

#### LUPUS ERYTHEMATOSUS: MODIFICATION OF THERAPY WITH GOLD COMPOUNDS

Herbert S. Alden and Jack W. Jones, Atlanta, Ga. (*Journal A. M. A.*, Oct. 10, 1936), state that as much as they would like to share Semon's prophecy and hope of 1927 that the gold compounds will in the future be as specific and efficacious in lupus erythematosus as arsenic is in syphilis, they find it impossible to do so. In all the cases herein reported they have throughout given amounts of gold that are relatively small in the light of previous reports, with results not as spectacular but comparable. They have used a prepared stable aqueous solution of gold and sodium thiosulfate which is simple in application and is given subcutaneously rather than intravenously and hence is less likely to result in accidents either from the method or from biologic phenomena. Taken as a whole the injection of gold and sodium thiosulfate subcutaneously in their cases has been free from fear of untoward reactions and simple in application and not uncomfortable to the patient, as well as efficacious in the relief of symptoms of lupus erythematosus. They believe that, all things considered, this method of giv-

ing gold salts to patients with lupus erythematosus is probably safer, more fool proof, simpler, and probably as efficacious as the intravenous route.

#### TERMINATION OF 1,000 ATTACKS OF MI- GRAINE WITH ERGOTAMINE TARTRATE

Mary E. O'Sullivan, New York (*Journal A. M. A.*, Oct. 10, 1936), states that ergotamine tartrate administered to ninety-seven patients checked or aborted 1,042 attacks in eighty-nine of these persons. It was calculated that the individuals in this series were relieved from 39,000 hours of suffering. The earlier in the attack the medication is given, the better are the results. When used subcutaneously, the alkaloid has never failed to check again an attack in a person previously relieved if the drug was given in adequate dosage. Untoward effects of the drug may be relieved by simultaneous injection of 1/100 grain of atropine or calcium gluconate intravenously. She does not consider the drug a cure for migraine. She strongly advises against its dispensation without a consideration of the cause and prevention of the syndrome. Because of the constancy and character of the relief obtained from 1,042 headaches in eighty-nine sufferers of migraine after the administration of ergotamine tartrate, she recommends its use for the termination of these attacks and believes that the drug is a valuable addition to medical therapeutics.

#### WHO EATS THE TAXES?

A press dispatch from Washington December, 1933, stated that more than six million men and women are now on Uncle Sam's payroll. This meant approximately one out of every twenty persons in the United States is living off the federal government. Now add to this six million the number of persons on the payrolls of states, cities, counties, towns, school districts, etc.—that is, persons who gain their living from funds secured through taxes—and you have a fair idea of why your income is near the zero mark.

To justify this enormous payroll it will be claimed that it is a matter of emergency relief. But have these excessive expenditures been made because the people of the United States asked them, or because well organized, active, energetic and vociferous minorities urged them? Did you ask for them? Do you know of any of your neighbors who did? Your community is typical of all in this country. In truth, have not the demands for these excessive expenditures come from minorities who have imbibed freely of certain foreign theories?—*Committee on American Education.*

#### COOK PORK THOROUGHLY

Science for Nov. 20, gives a serious warning about more cooking fresh pork, for San Francisco in a series of 200 post-mortems gave almost one-fourth as infected. Two out of 10 specimens fresh pork sausage from first class markets gave living *Trichinella*. Hence the consumer must take the responsibility of prevention and more care in cooking, for meat inspection is not reliable.

## Original Articles

### THE CLINICAL ASPECTS OF AMEBIASIS

SAMUEL E. MUNSON, M. D.

SPRINGFIELD, ILL.

It is well understood before describing the symptoms of this disease that the clinical term "Amebiasis" is the invasion of the tissues by an ameba—the *Entameba histolytica*, pathogenic to man. While the term "Amebic Dysentery" is only one of the many symptoms or manifestations of the disease.

While dysenteric symptoms quite commonly accompany the infection, more particularly the severe type of the tropics, a much greater number of cases manifest only much milder symptoms which are attributed to some other disease and may thereby go unrecognized.

Because the disease was formerly described in many text-books as "Amebic Dysentery" and only thought to be found in the tropics, most physicians in temperate and cold climates were made unfamiliar with the protean manifestations of the disease itself.

As stated by Craig: "It is essential to understand the method by which the *Entameba histolytica* produces the lesions in the intestines and the character of these lesions in the consideration of the symptomatology of amebiasis.

"This parasite has the power of penetrating the mucous membrane of the intestine, both by cytolyzing the tissue and also by virtue of its ameboid movement, thereby reaching the submucous and muscular coats of the intestines, producing the characteristic ulcerative lesions."

These ulcerative lesions may be present without the patient having any noticeable symptoms, either subjective or objective. Without symptoms, one may be a carrier of *Entameba histolytica*, and as shown by the number of cysts excreted, indicating that thousands of amebae are present in the intestinal tract. These lesions become invaded by numerous bacteria and the absorption of toxic substances, producing typical symptoms of low grade toxemia.

It is readily understood that any clinical classification is difficult because of the tendency of

the symptoms to merge from one class into another.

According to Craig there are four classes:

Class 1: Those who harbor the parasite without any appreciable symptoms. So-called healthy carriers.

Class 2: Those who present indefinite or slight symptoms connected with the gastrointestinal and nervous systems; usually considered healthy carriers.

Class 3: Those who have attacks of diarrhea, recurring with other symptoms.

Class 4: All those that suffer from acute or chronic amebic symptoms.

The first three classes belong to the temperate and sub-tropical regions by a great majority.

*Symptoms in Carriers:* A postulate that seems to hold good with most of the writers on this subject—that there are no healthy carriers and that practically every untreated carrier of the parasite either has symptoms of the infection or spontaneous recovery occurs.

The symptomatology of amebiasis in carriers is largely that of the gastrointestinal tract, the circulatory and nervous systems.

*Gastro-Intestinal tract:* The symptoms most generally noted are constipation, disappearing attacks of diarrhea, colicky pains in lower abdomen or right iliac region, anorexia or capricious appetite, gaseous distention of the abdomen after partaking of food, gaseous eructations and slight nausea before eating or following meals.

*Nervous System:* Most noted symptoms are neuralgic pains in lower abdomen, back or legs, dull frontal headache, sleepiness or disturbed slumber, poor memory or inability to concentrate on work, dull pain in muscles of legs, with almost constant aching in lumbar region.

*Circulation:* The symptoms of the circulating system are irritable pulse, arrhythmias, vasomotor disturbances such as skin flushing and excessive perspiration of hands and feet, with tachycardia.

The *physical signs in carriers* are underweight, sallow skin, slight anemia, irritable pulse, tenderness in right iliac fossa, distention of abdomen with frequent tenderness over the liver.

*Discussion of Symptoms in Carriers:* Abdominal pain or gaseous distention:

This pain may be referable to any of the viscera or any portion of the colon in the sigmoid or rectal region. Also frequently found



in the region of the appendix or referred to the right shoulder with a diagnosis of cholecystitis.

The following cases illustrate the misinterpretation of amebic symptoms for appendicitis: (Reported by Lund & Ingam, of Boston, J. A. M. A., Oct. 1933).

Following a meeting in a hotel in Chicago of about 125 lumbermen from U. S. and Canada, June 30 to July 2, 1933, there occurred numerous cases of acute colitis and at least five deaths. The following cases, on account of being members of a special committee, had all of their food and water at this hotel for three days:

Case 1: W. B., aged 43 years. July 12, acute attack of epigastric pain, followed with nausea and vomiting. Admitted to hospital in New York. Suprapubic tenderness and pain. Absence of diarrhea or bloody stools. W. B. C. 18,000. Poly 90%. Temperature: 99.6. Following day, laparotomy was performed, with a preoperative diagnosis of appendicitis; decidedly inflamed appendix and ulcer of the cecum. Wound was closed without drainage. Examination disclosed diffuse vessel injection. Diagnosis: Acute gangrenous ulceration of the cecal wall and acute appendicitis. On account of symptoms, his abdomen was opened and explored again, wound being carefully explored in the belief that an abscess had formed. Patient developed fecal fistula; died August 4. Repeated examinations of the stools from July 19 to 26 were negative for typhoid bacilli and *Entameba histolytica*. Blood agglutination test for typhoid and bacillary dysentery were also negative.

*Autopsy:* Ulcers of the entire large bowel; cecum and ascending colon gangrenous; microscopical examination of ulcers of the bowel revealed *Entameba histolytica*.

Case 2: Report of a man taken sick on July 28; died on Aug. 24. Cause of death: Right, sub-phrenic abscess.

Case 3: M. E. R., from Seattle Lumber Company. August 28, had exploratory laparotomy and appendectomy. Died on Sept. 5.

*Autopsy:* Encapsulated cavity in liver, filled with dirty, grayish material. There was found non-motile *Entameba histolytica*.

Case 4: Lumberman from Louisiana. Had indigestion July 14. Stools were examined for ameba but negative. Had positive agglutination test for dysentery and was given serum. Died August 2 of peritonitis. No autopsy performed.

Case 5: Member of Louisiana lumber company. Died of acute colitis, three weeks after Chicago meeting. Amebic dysentery suspected.

*Abdominal distention* has been mentioned as one of the most common symptoms noted in carriers, following eating, and lasting for several hours, usually occurring after partaking of any unusual food which would not occur in a normal individual.

*Constipation* is rather the rule in carriers and may alternate with slight attacks of diarrhea.

*Diarrhea:* There may be considerable mucus, more rarely slight amount of blood. Attacks frequently occur at night with copious stools. Motile trophozoites of *Entameba histolytica* are present with precystic and cystic forms, occurring as the stools begin to be formed. Others may have regular daily bowel movement, semi-formed with small amount of mucus.

*Disturbance of Appetite:* Patient may have ravenous appetite, or vary with every symptom of gastritis to complete anorexia.

*Loss of Weight:* A notable symptom. When found in a young person, will become quite normal when successfully treated.

*Headache:* Mostly of the frontal type. May be persisting, occurring at some time day or night. Disturbed slumber is frequently noticed. Many individuals fall to sleep during the day and evenings after meals.

*Memory Impairment:* The physician oftentimes makes a mistaken diagnosis of neurasthenia or exhaustion, advising a vacation from work and worry.

*Neuralgic Pain:* These may be noticed in the lower abdomen or lumbar region.

*Fever:* May be noticed in late afternoon, one or two degrees, probably due to absorption from toxic material from bacterial invasion. Subnormal temperatures may occur during mornings, with palpitation from weak heart action.

*Tenderness Over the Abdomen:* As stated before, there is no doubt that many individuals are needlessly operated upon in the belief that the amebic patient was suffering from chronic appendicitis.

*Gall Bladder:* Some authorities believe that there is a form of cholecystitis caused by an invasion of *Entameba histolytica*. In one case that came to a clinician of Chicago, a diagnosis of *Entameba histolytica* infection was made by finding the parasite in a Lyons' drain.

As stated by Craig: He is convinced "that a considerable portion of patients that crowd our gastroenterological clinics, complaining of vague and indefinite symptoms connected with the gastrointestinal tract, and we are unable to arrive at a diagnosis, are really carriers of *Entameba histolytica*."

The absence of diarrhea does not preclude the absence of the parasite. Hence the importance



of routine stool examinations, particularly where there is a history of any gastrointestinal symptoms.

*Symptomatology of Amebic Diarrhea or Enteritis:* Same conditions as mentioned as occurring in carriers, but with the addition of recurring attacks of diarrhea lasting for several days or weeks.

All symptoms mentioned as noted in the carrier are much more pronounced—sallowiness of the skin, presence of abdominal colic, with tenderness and loss of weight.

Stools have more mucus and are mushy, with the passage of much gas. These attacks may last three or four days or continue for two or three weeks. This may be unaccompanied by any blood. These stools, microscopically, contain a few leukocytes, intestinal epithelium and a few red corpuscles, with the motile trophozoites of *Entameba histolytica*.

A daily rise of temperature and a leukocytosis of over 12,000 per cu. mm. should lead to careful examination. With tenderness over the liver one should think of beginning liver abscess.

*The Incubation Period:* Walker and Sellards experimented with 20 men who volunteered; 17 became parasitized. From the time of the feeding and the occurrence of the ameba in the stools, it was one to four days. Four men developed symptoms of acute dysentery. Average time was 64.8 days.

In the recent Chicago epidemic the incubation period was very short in most cases—as early as four days after the exposure. Such short period is rarely observed in those with dysenteric symptoms. It is inferred in these short periods of incubation that there must be enormous dosage of cysts ingested by the exposed individuals.

*Symptomatology of Acute Dysentery:* In the acute type of dysentery there is much variation in the severity of the symptoms, from those cases where only a few blood stained stools are passed without marked symptomatology, to those in which death occurs from the fulminant gangrenous types in a few hours.

In the tropics and sub-tropics the latter type, or severe type, are more frequently found than in the temperature zones.

*The onset* of amebic dysentery may be abrupt, or occur with an attack of diarrhea. Nausea or vomiting may be present, accompanied with general malaise and severe headache.

These symptoms may be preceded by severe colicky pains with desire to defecate. The stools may be solid at first, followed in a short time by semi-fluid or fluid stools and contain much mucus streaked with blood.

Where the diarrhea continues for several days, marked tenesmus, with great discomfort to the patient is noticed. The stools may consist of almost pure mucus and blood.

A characteristic, offensive, musty albuminous odor may be noticed by those who have much experience with these cases.

*Average number* of stools are from 15 to 20 a day. For the first few days the prostration may not be as great as in bacillary dysentery.

*Fever:* May be present, ranging from 100 to 101; in milder cases from 99 to 100.

Where the cases are of the more mild type and less frequent stools, the patient may continue about his occupation without having suspicion of the cause of his condition.

(To Illustrate an *Acute Case*)

Case of V. F.: Age, 30 years. Occupation, traveling salesman. Came for examination and consultation, Jan. 20, 1934. Had been traveling in and out of Chicago, beginning in October, 1933, stopping at Strand Hotel Oct. 27; Auditorium Hotel, Oct. 28-31; back at the Strand Nov. 3-5. In Milwaukee, Nov. 6-17. Continued to be in and out of Chicago, also visiting St. Louis, until about the time he was seen here in January. Had been living in Springfield about a year.

*Family History:* Negative. Married; wife in good health; no children.

*Past History:* At one time had slightly increased B. P., but with diet this improved and had no further trouble. No other history of any consequence.

*Present Symptoms:* First noticed blood in stools November 10, 1933, and present every day since. Bowels move five to six or more times a day; often without any feces, but only blood and mucus. Bloody mucus particularly in first portion of stools, but present in all the stools. More noticeable mornings and evenings than during the day. Stools soft and ragged; never well formed. Taking mineral oil almost every day. Has heavy feeling in epigastrium and when he presses over this region he feels sore. Appetite not good; eats only from habit. Eats at hotels and restaurants except when home on Sunday. Smokes cigarettes to excess. Sleep not good since symptoms began; not able to get to sleep on account of pain in lower bowel and desire to have bowel function. Has some soreness in elbow and right knee.

*Physical Examination:*

*Appearance:* Strong, rugged appearance; height, 6 ft., 1 in.; weight, 197. Skin sallow, with slightly undernourished appearance.

*Abdomen:* Negative except soreness over lower part.

*Rectal:* No appearance of ulcers of rectum or inflammation of mucous membrane.

*Laboratory: Urine:* Trace of sugar. *Blood count:* Hemoglobin 90. W. B. C. 13,600. *Kahn:* Negative. *Feces:* Occult blood, positive, 4 plus. Parasites of *Entameba histolytica* positive.

*Severe Types of Dysentery:* All the symptoms in the less severe types are observed, but with much more sudden onset, with sloughs of intestinal mucous membrane with offensive odor.

*Temperature* range is 101 to 103.

*Leukocytosis* is much higher, even 25,000 to 30,000. After a few days of delirium the patient succumbs from cardiac failure or one of the many other complications.

It is highly probably, as mentioned by Craig and others, that these severe cases of amebic dysentery are mixed types of infection with bacillary dysentery or complicated with some secondary bacterial infection.

*Symptoms of Chronic Amebic Dysentery:* The majority of acute cases usually improve for longer or shorter intervals, with reoccurring attacks, having periods of constipation with intervals of diarrhea in which much mucus and blood is observed. This condition may continue for weeks and months and is usually called the sub-acute amebic dysentery.

As these events follow along with regular sequence, this is now called the chronic form. Some of these patients may become invalids, confined to the chair or bed.

(To Illustrate a Chronic Case)

March, 1921.

Case of A. C.: When attempting to rise in the night, became very dizzy. Sugar and diacetic acid found in urine next day.

*Previous History:* Four years ago was confined to his room for few days and home for a week, on account of frequent bowel movements. Was seen by a physician and treated for bleeding piles. No discomfort in abdomen. Very dizzy at that time.

*Examination:* Physical findings negative. B. P. variable but generally low. *Laboratory:* Kahn negative. *Urine:* Sugar and diacetic acid present, but disappeared after about 10 days with diet.

*Later Symptoms:* September, 1924. Patient continued well after March, 1921, but returned in September, 1924, complaining of dizziness and insomnia. *Urine* negative. In December, 3 months later, complained of soreness and distention in bowels; worse toward evening; had been passing some blood from bowels, with great amount of gas, with pain across lower abdomen. R. B. C. normal. W. B. C. 7,000. Patient thought he had a reoccurrence of his piles, but examination disclosed no indication of this.

*Examination of Stools:* (Dec., 1924). Occult blood, positive. Parasites and ova not found. Pus cells, two plus. T. B. not found.

An examination of the stools was made again on the following day, with the suggestion to the laboratory technician that the patient had either T. B. of the rectum (not probable because of negative x-ray of chest), or ameba coli. With this suggestion, further examination revealed active *Entameba histolytica* positive, two plus.

This patient was put to bed under the care of a nurse, and given intensive treatment with emetine hydrochloride and large doses of ipecac, controlled with opium.

This treatment was followed by neoarsphenamine, intravenously.

During this time this patient had intermittent glycosuria, and on account of the appearance of glycosuria, it was thought he also had interstitial pancreatitis and hepatitis, both due to infection of *Entameba histolytica*.

Blood findings continued about the same. At no time was there a leukocytosis.

Cysts were found in the stools under this treatment until in June, after which time he was put upon an arsenical preparation—stovarsol, as recommended by Dr. Johns, of New Orleans.

After the course of this treatment, the stools became entirely negative to any of the cysts and the patient, under observation, became entirely well.

This patient passed out from under my care, but I understood ten years later he had a recurrence.

It is during this chronic period that the many complications mentioned may arise, only to be found upon post-mortem examination, unsuspected and only too often mistaken for some other disease.

If recognized and treated for a long period, the diarrhea may not be controlled, due to the loss of the mucous membrane over large areas of the intestines, from ulceration and replacement by masses of dense fibrous tissue.

*Blood Picture:* (In the Chronic Types). In the chronic types, symptoms of secondary anemia may develop, as simulating pernicious anemia. This may be mild or severe. Where the condition has not existed for a long time, the blood count may be found between  $3\frac{1}{2}$  to 4 million red cells. Where the disease persists for a longer period, with severe complications, red cells are found even lower than this.

Where the leukocytes are found above 12,000, abscess in the liver or elsewhere in the body should be considered.

Where there is secondary involvement, with streptococcus, the leukocytes may range very high—30,000 or more.



In all the long-standing cases, particularly where process of digestion is impaired, the hemoglobin drops from 15 to 30%.

In these chronic types, with complications, instead of the sallow complexion, as the patient becomes more emaciated and weak, the skin takes on a grayish pallor and the patient appears pale and haggard, with general appearance of serious condition.

*Death:* Caused by exhaustion, abscess of the liver, broncho- or lobar pneumonia, subphrenic abscess, empyema, abscess of the spleen or the brain, rupture of the bowel, appendicitis—with accompanying symptoms of these organs.

#### CONCLUSIONS

1. On account of the prevalence of amebiasis, it has become a public health problem.

2. On account of this prevalence, estimated from 5 to 10%, every physician should familiarize himself with the symptoms of both the dysenteric or acute form, and with the latent and cystic form.

3. A campaign of education as to the incidence of amebiasis, that prophylactic measures may be put into effect in every household to guard against this disease.

4. The examination of all food handlers, not only in hotels and restaurants, but of roadside eating places, which have multiplied a thousand times since the hard roads of the country and travel by automobile.

416 Ridgely Bank Building.

#### LABORATORY METHODS FOR THE DIAGNOSIS OF AMEBIASIS

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#### CHICAGO

1. Definition.

2. Differential characteristics of the Intestinal Amebae of Man:

A. *E. histolytica*

- a. Trophozoites
- b. Precysts
- c. Cysts

B. *E. coli*

- a. Trophozoites

b. Precysts

c. Cysts

C. *Endolimax nana*

- a. Trophozoites
- b. Precysts
- c. Cysts

D. *Iodameba bütschlii*

- a. Trophozoites
- b. Precysts
- c. Cysts

E. *Dientameba fragilis*

3. Diagnostic Procedures:

A. Character of stool and collection of specimen

B. Examination

- a. Active cases
- b. Convalescent cases, and carriers
- c. Pus from liver and lung abscesses
- d. Procedures for fixing and staining
- e. Concentrating stool for cysts
- f. Cultural methods
- g. Complement fixation

C. Illustrations

1. *Definition.* "Amebiasis is the state of being infected with amebae. In practice it refers to *E. histolytica*." Dobell.

"Amebiasis is the invasion of the tissues of man by *E. histolytica*. The invasion is primarily through the mucous membrane of the large bowel—much more rarely through the mucous membrane of the ileum.

"*Amebic Dysentery* is a bloody mucoid diarrhea caused by *E. histolytica* and occurring as one of the manifestations of amebiasis." Craig.

#### 2. DIFFERENTIAL CHARACTERISTICS OF THE INTESTINAL AMEBAE OF MAN

The main criterion upon which the differences are based is largely the nuclear structure which involves the thickness of the nuclear membrane, size, type, and position of the karyosome, linin network (delicately stained fibrils in spaces between the karyosome and the nuclear wall), and chromatin granules. In addition to the nuclear structure, various other features are important—the number and type of nuclei, the type of chromatoid bodies, and the glycogen.

##### A. *E. Histolytica*

*E. histolytica* is divided into different races according to the size of cysts produced (Plate 1, Figs. 1-18). (Plate 2, Figs. 19-29).

*Trophozoite*—15-80 microns.



*E. histolytica* which produces small variety cysts are usually smaller and not quite as rapidly motile as those producing large variety cysts. In the cases which we have had we have never

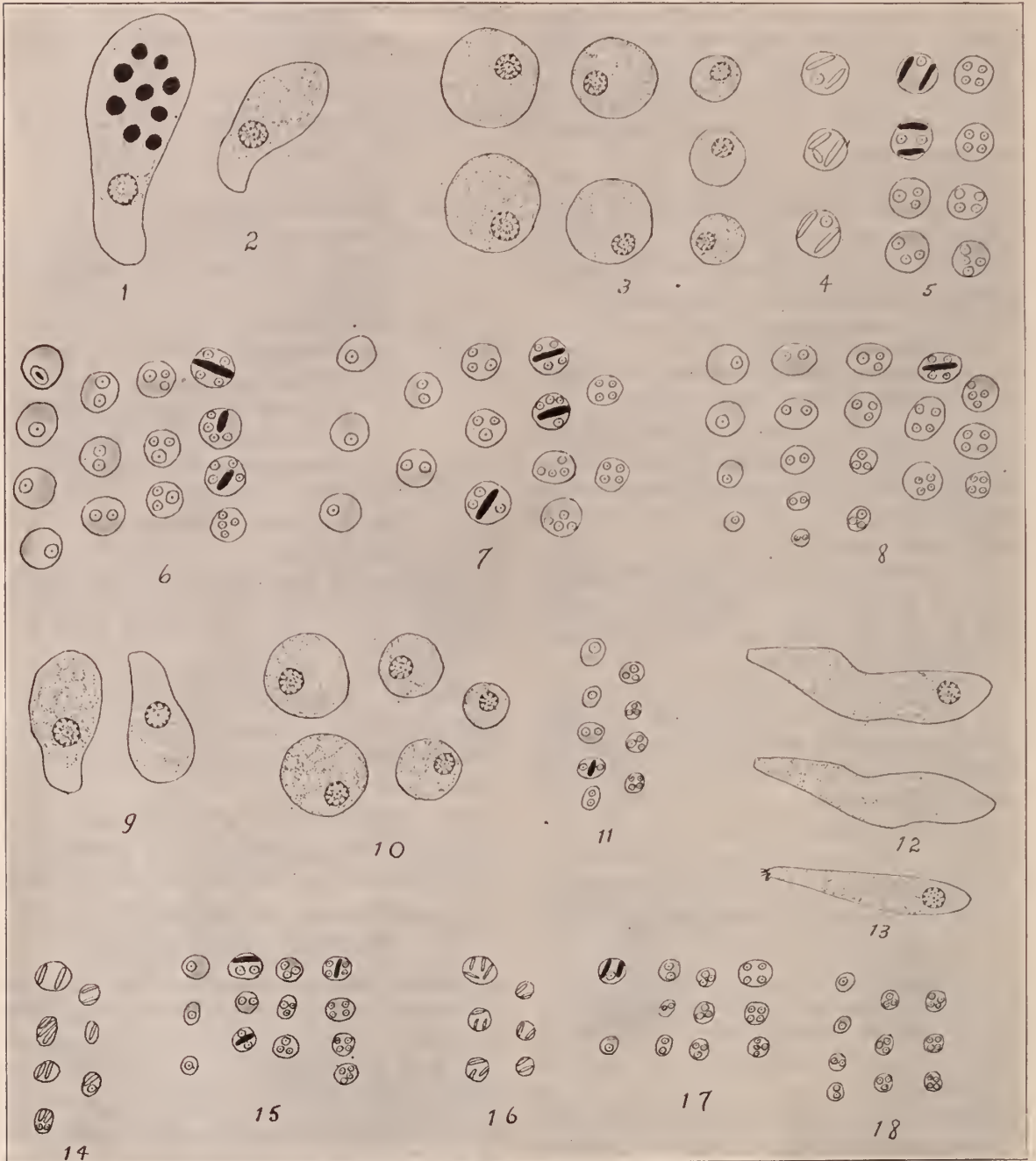


Plate 1.

NOTES EXPLAINING THE DRAWINGS

Most of the drawings were made from moist preparations (saline, water and iodine) of fresh material, with a camera lucida, using a number 10 eye piece and a high, dry, 1/6" objective. (Bacteria, crystals, yeast cells, starch grains, red blood cells, karyosomes, chromatoid bodies, and chromatin granules have been filled with India ink in order that they may show up better.) The oil immersion lens was used in making drawings from sections of tissue and from iron-hematoxylin preparations.

Plate 1, Figures 1-8 *E. histolytica* (Large variety, except for few small cysts, Fig. 8); Figures 9-18, small variety.

Fig. 1. Trophozoite, showing the nucleus and red blood cells (from a bloody mucous stool of an active case, M). (Red blood cells, chromatin granules, and karyosome filled in with India ink to show up better.)

Fig. 2. Trophozoite passing into the precystic stage (water preparation.)

Fig. 3. Precysts of various sizes (water preparation.)

Fig. 4. Young cysts (water preparation) showing typical

been able to find red blood cells in the trophozoites which gave rise to small variety cysts. Bloody mucous stools from acute cases of amebic dysentery usually show quite large *E. histolytica* trophozoites; whereas the trophozoites found in soft stools from mild cases of amebic dysentery are usually smaller in size approaching in size those which give rise to small variety *E. histolytica* cysts.

Cytologically the trophozoites have clear, glass-like ectoplasm and finely granular endoplasm. The motility is usually in a straight line by means of a single large blade-like pseudopodium which moves rapidly and explosively. Usually the nucleus flows into the pseudopodium first, the red blood cells and the finely granular material follow the nucleus into the pseudopodium. In fresh, bloody mucous stools (from acute cases of amebic dysentery) the motility is very rapid. In old stools the motility is more sluggish and the pseudopodia are blunt blade-like.

*Precysts*.—Before encystment the organism becomes round or slightly oval, hyaline (by ridding itself of ingested material), smaller in size, and loses motility completely or it may continue to send out very small blunt pseudopodia. The nucleus consists of a delicate wall lined internally with a ring of small refractile chromatin granules. In the center of the nucleus is a small karyosome. The precyst secretes a delicate wall and encysts.

*Cystic stage*.—Size 5-20 $\mu$  (small variety, 5-12 $\mu$ ; large variety, 12-20 $\mu$ )—The cysts contain 1-4 nuclei, although as many as 8 have been described. The nuclei have characteristic structures—thin nuclear membrane composed of fine granules of chromatin and a very small centrally placed karyosome.

Young cysts have typical chromatoid bodies—rods with blunt ends. These show up best in moist preparations. In iodine stained prepara-

tions, brown staining glycogen may be seen. Both the chromatoid bodies and the glycogen disappear when the cysts are old.

#### B. *E. COLI*: (Plate 2, Figs. 30-32)

*Trophozoite*.—The trophozoites vary in size from 15-50 $\mu$ , the average size being about 20-25 $\mu$ . As a rule there is no differentiation between the ectoplasm and the endoplasm. There are many food vacuoles containing ingested material—bacteria, crystals, starch grains, pus cells, yeast cells, flagellates, and *E. histolytica* cysts. The organism moves sluggishly in one direction for a short distance, halts, produces a pseudopodium from another portion of the body, and moves in another direction, chiefly by changing its shape. Occasionally one encounters very motile *E. coli* which may be confused with *E. histolytica*. In such an event careful examination will reveal ingested debris, bacteria, etc., which does not usually happen with *E. histolytica*. In case of doubt, stained preparations should be made, using the iron-hematoxylin method and the nuclei should be studied carefully. Repeated direct stool examinations should be made, as well as cultures.

Cytologically, the organism contains a visible nucleus surrounded by a thick membrane composed of coarse chromatin granules. The karyosome is fairly large and usually to one side of the center. Chromatin granules are present in the clear zone between the karyosome and the nuclear membrane.

*Precystic stage*.—15-30 $\mu$ —In this stage it is frequently difficult to differentiate *E. histolytica* from *E. coli*. As a rule, however, *E. coli* has a thicker wall, the cytoplasm is more granular, and the chromatin granules are coarser.

*Cystic stage*.—10-30 $\mu$  (average size 14-20 $\mu$ )—The cysts of *E. coli* have fairly thick walls. There are 1-8 nuclei (16-32 have been described). We have seen 12-16 nuclear cysts.

chromatoid bodies and nuclei. (Figs. 3 and 4 are from case M. M.).

Fig. 5. *E. histolytica* cysts, large variety (iodine preparation) showing nuclei with karyosomes, chromatoid bodies and glycogen. (Case M.).

Fig. 6. *E. histolytica* cysts—large variety, case R. (iodine preparation).

Fig. 7. *E. histolytica* cysts, large variety (iodine preparation) showing nuclei with karyosomes, chromatoid bodies and glycogen (Case M. M.).

Fig. 8. Large intermediate, and small *E. histolytica* cysts, case C. M. (iodine preparation).

Fig. 9. Trophozoite showing nuclei (water preparation).

Fig. 10. Precysts (water preparation).

Fig. 11. Cysts, (iodine preparation).

Fig. 12. Trophozoites from a 24-hr. culture (case H. Sch. same as Figs. 9, 10, and 11).

Fig. 13. Trophozoite from a 24-hr. culture from case R.

Fig. 14. Small and intermediate cysts (water preparation) showing chromatoid bodies and nuclei (case R. G.).

Fig. 15. Small and intermediate *E. histolytica* cysts (iodine preparation) same as case in Fig. 14).

Fig. 16. Small and intermediate *E. histolytica* cysts (water preparation). From case Wm. L. J.

Fig. 17. Intermediate and small *E. histolytica* cysts (iodine preparation) from same case as Fig. 16.

Fig. 18. Very small and intermediate cysts of *E. histolytica* (iodine preparation) same case as Figs. 16 and 17.

The karyosome is usually large and eccentric. like, with sharply pointed ends. Glycogen is present in young cysts. In the single nuclear

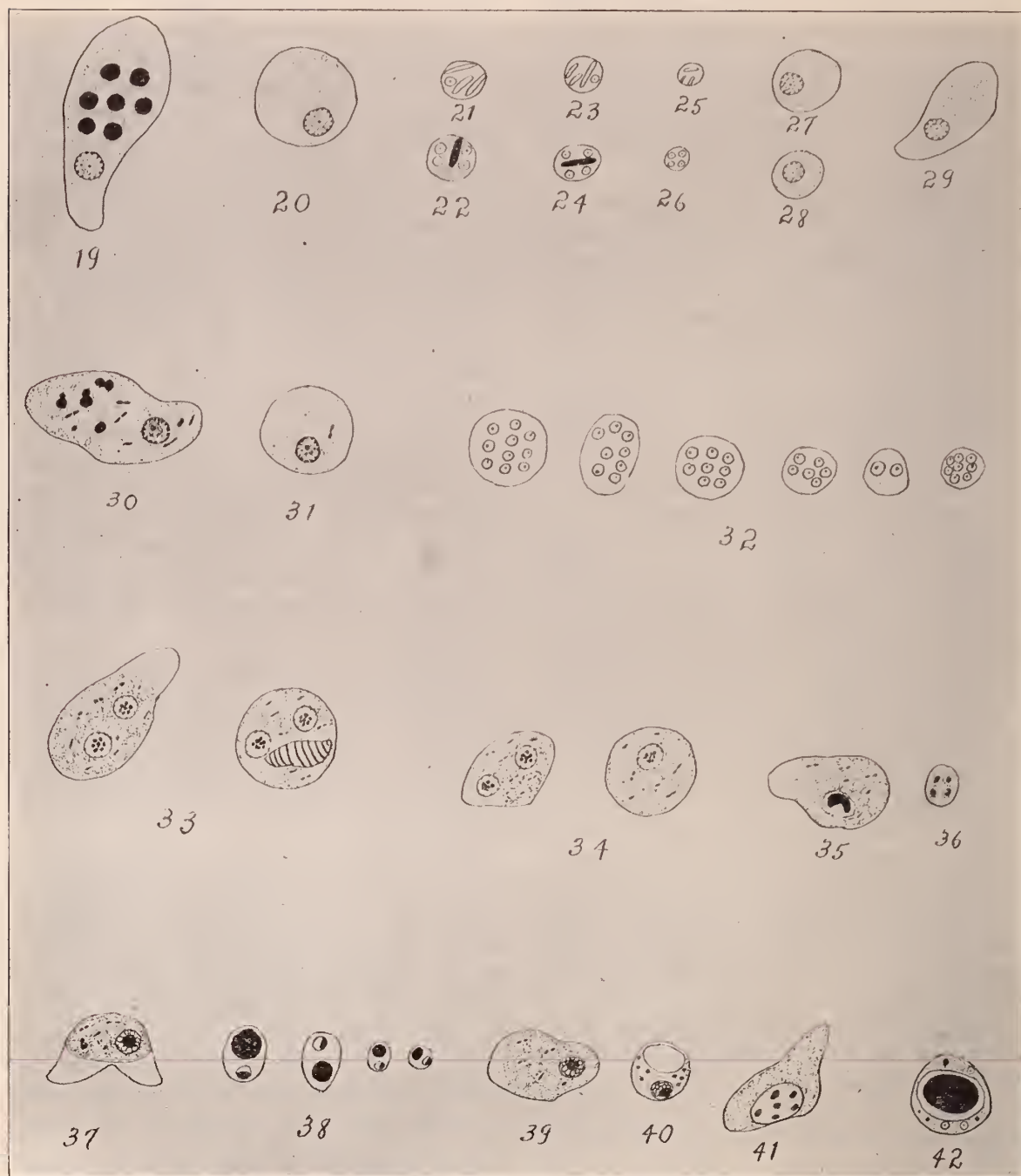


Plate 2.

## PLATE 2

Fig. 19. *E. histolytica* trophozoite from a bloody mucous stool.

Fig. 20. *E. histolytica* precyst (water preparation).

Fig. 21. *E. histolytica* cyst, large variety (water preparation).

Fig. 22. *E. histolytica* cyst, large variety (iodine preparation).

Fig. 23. *E. histolytica* cyst, intermediate size (water preparation).

Fig. 24. *E. histolytica* cyst, intermediate size (iodine preparation).

Fig. 25. *E. histolytica* cyst, small variety (water preparation).

Fig. 26. *E. histolytica* cyst, small variety (iodine preparation).

Figs. 27, 28 and 29. Large precyst, small precyst, and trophozoite from a specimen showing small variety *E. histolytica* cysts.

Figs. 30-32. *E. coli*:



stage the nucleus is large, becoming progressively smaller with the increase in the number of nuclei.

C. *Endolimax nana* Wenyon and O'Connor, 1917 (1918)

(Plate 2, Figs. 35 and 36)

*Trophozoite*.—8-15 $\mu$ —The cytoplasm is granular, containing food vacuoles filled with bacteria, yeasts and debris. The motility is by means of short, blunt, hyaline pseudopodia, which are thrown out and withdrawn slowly. In fresh material or in cultures the motility may be by means of slender, finger-like pseudopodia. The nucleus has an indistinct wall without chromatin granules. The karyosome is large and irregular.

*Precystic stage*.—In unstained preparations it is refractile, round or oval. The cytoplasm is free from vacuoles, bacteria, and debris.

*Cystic stage*.—5-12 $\mu$ —In unstained preparations the cysts appear as refractile, colorless, round or oval bodies containing 1-4 nuclei. In stained preparations the characteristics stand out plainly—there are 1-4 nuclei with faint nuclear membranes and no chromatin granules. There is a large central or eccentric karyosome in each nucleus. Glycogen is rarely seen.

D. *Iodameba bütschlii* von Prowazek, 1912; Dobell, 1919 (Plate 2, Figs. 37-40)

*Trophozoite*.—5-20 $\mu$  or larger (average 10-15 $\mu$ )—It is a small ameba moving sluggishly, as a rule, by means of broad, round, and hyaline pseudopodia. In living trophozoites the nucleus is frequently invisible. In well stained preparations however, the small nucleus (2-3.5 $\mu$ ) with its large central karyosome, shows up well. The nuclear membrane is usually achromatic. Between the karyosome and the nuclear membrane is a zone filled with granules. When the preparation is well stained the linin network (between the karyosome and the nuclear membrane) shows up. The cytoplasm is homogeneous

and finely granular, containing food vacuoles filled with bacteria, crystals and various debris.

*Precystic stage*.—In this stage the organism is free from food vacuoles; it appears clear, glassy white and contains a large nucleus. It rounds up, secretes a cyst wall and encysts.

*Cystic stage*.—6-20 $\mu$  (average, 9-12 $\mu$ )—There is a great variation in shape of the cysts; round, oval, rhomboidal, etc. There are one or more glycogen masses staining from pale to mahogany brown with iodine. Other inclusions appear giving staining reactions of volutin. Usually there is only one nucleus, rarely two. The nucleus differs in that the granules are massed at one pole and the karyosome is pressed toward the wall, producing a "signet ring" appearance.

E. *Dientameba fragilis* Jepps and Dobell, 1918

(Plate 2, Figs. 33 and 34)

*Trophozoite*.—Usually described as being small, about 12 $\mu$ , but they may be quite large, as large as *E. histolytica*. The organism moves rapidly by means of flattened, leaflike, hyaline pseudopodia. There is differentiation between ecto- and endoplasm. The cytoplasm may be finely or coarsely granular, containing food vacuoles filled with bacteria, yeast cells, starch grains, etc. The most important diagnostic feature is the presence of two nuclei. On dividing, the organism results in two uninucleate individuals, the nuclei of which divide, resulting in binucleate organisms. The nuclei are bounded by fine membranes. The karyosome is usually in the center, but may be at one side of the nucleus. The karyosome is composed of granules, usually only four large, deeply stained, chromatin granules.

### 3. DIAGNOSTIC PROCEDURE

All stools should be collected in clean, dry containers, free from disinfectants. Oil, bismuth, barium, and medications render the stools undesirable. All stools should be examined as fresh

Fig. 30. Trophozoite (water preparation).

Fig. 31. Precyst (water preparation).

Fig. 32. Cysts of various sizes and number of nuclei (iodine preparation).

Figs. 33 and 34. *Dientameba fragilis*:

Fig. 33. Trophozoites from saline preparation.

Fig. 34. Trophozoites from iron-hematoxylin stain.

Figs. 35 and 36 *Endolimax nana*:

Fig. 35. Trophozoite (iron-hematoxylin stain).

Fig. 36. Cysts (iron-hematoxylin stain).

Figs. 37-40. *Iodameba bütschlii*:

Fig. 37. Trophozoite (water preparation) showing pseudopodia.

Fig. 38. Cysts (iodine preparation).

Fig. 39. Trophozoite (iron-hematoxylin stain).

Fig. 40. Cyst (iron-hematoxylin stain) showing nucleus, glycogen vacuole and volutin granules.

Fig. 41. Macrophage from a section of an amebic ulcer of the bowel.

Fig. 42. *Blastocystis hominis*. (It is a vegetable organism, a non-pathogenic fungus, about 5-40  $\mu$  (micron) in diameter. It may be oval or spherical with a narrow band of cytoplasm containing refractile granules and one or more round or oval nuclei surrounded by a delicate membrane. Dividing forms, seen so frequently in cultures, have an hour glass appearance due to the constriction near the center of the cell).

In hematoxylin stained preparation the narrow band of peripheral cytoplasm is unstained and contains well stained nuclei with large deeply staining karyosomes.

as possible. Soft and bloody mucous stools should be examined immediately or as soon as possible and should never be left over night.

No person should be pronounced negative until six stools have been examined on different days. Some of these stools should be obtained normally, and others following the administration of salt. In choosing material for examination, any part of the homogeneous stool and every part of the heterogeneous stool should be examined.

The macroscopic appearance of the stool is significant—whether it is hard, soft, liquid and whether it contains blood, pus and cellular exudate. A soft stool, intimately mixed with blood and mucus, containing pus and cellular exudate, is much more indicative of bacillary than of amebic dysentery (F. W. O'Connor), whereas bloody, mucous stools are highly suspicious for amebic dysentery.

Balantidial dysentery due to *Balantidium coli*, a ciliate, is indistinguishable clinically from amebic dysentery. The differential diagnosis must be made by finding the etiological organism.

In alcoholic diarrhea the stools simulate those in amebic dysentery in appearance, but persistent examinations of the stools fail to reveal *E. histolytica* and the patient gets well after several days' rest in bed.

In syphilitic ulcerations of the rectum, the stools may be diarrheal or semi-solid, containing mucus and shreds of tissue. The positive Wassermann test is of diagnostic importance here.

Tuberculous ulceration of the bowel, a common complication of pulmonary tuberculosis, is associated with frequent stools containing mucus and small amounts of blood, except shortly before death, when massive hemorrhages may occur. Finding tubercle bacilli in the stools is of no great importance because a patient with pulmonary tuberculosis may swallow some tubercle bacilli in the sputum.

In chronic mucous colitis there are mucous casts and no blood in the stools. Nonspecific ulcerative colitis, on the other hand, is associated with frequent stools containing pus, blood, and small amounts of cellular exudate.

In malignant diseases of the bowel the stools are frequent and contain much pus and blood (frequently chocolate in color). The differential diagnosis is based on the laboratory findings,

proctoscopic examination, and x-ray findings.

However, whatever the appearance of the stool, a careful examination of at least 4-6 smears should be made before pronouncing it negative. If anything suspicious is seen, a very careful examination should be made, making as many smears as may be necessary. If no decision can be reached, repeated stool examinations should be made by direct examination, by culture, and iron-hematoxylin preparations if necessary.

#### EXAMINATION

(a) *Bloody mucous stools from active cases of amebic dysentery.*—Specimens may be obtained with the proctoscope on proctoscopic examination, by means of a rectal tube, by inserting a glycerin suppository, or normally. A tiny granule of bloody mucus is chosen, placed on a slide, covered with a cover slip and examined under low power first and then under high dry for active *E. histolytica* with red blood cells in them. If the stool should contain fecal material it should be diluted first with a little warm saline to the proper consistency. This is done by placing a drop of warm saline on a slide, a little of the stool is taken on an applicator or needle and emulsified (mixed well) to reading opacity in the drop of saline covered with a cover slip, and examined as above. The diaphragm of the microscope should be closed as much as possible.

(b) *Examination of stools from convalescent cases and carriers.*—As the diarrhea of the active cases of amebic dysentery subsides following medication, or spontaneously, the feces remains longer in the large bowel, the active amebae lose their motility and begin to round off, giving rise to precysts. The precysts of *E. histolytica* are 20-30 $\mu$  in diameter, hyaline in appearance, and are free from granular material, or contain only very fine granular material (the remains of the red blood cells). The nucleus is typical, containing a small central karyosome, and is bounded by a fine membrane composed of fine chromatin granules. In this stage it is sometimes difficult to diagnose *E. histolytica*. Such stools may be cultured (on liver infusion, agar overlaid with serum, saline described later), whereupon the precysts vegetate, giving rise to typical *E. histolytica* trophozoites. If difficulty is still encountered, the examinations should be repeated on normal stools as well as those follow-



ing salts. Iron-hematoxylin preparations might also be made and examined for typical *E. histolytica* with the oil immersion lens.

As the stools remain longer in the large bowel they become more formed and the amebae encyst, giving rise to cysts containing 1-4 nuclei.

Formed stools from convalescent cases or from carriers should be examined with warm water or saline as well as with iodine. (The iodine solution should be fresh—a 1% aqueous solution of iodine in 2% potassium iodide, or an aqueous solution of 5% potassium iodide saturated with iodine and diluted with an equal part of distilled water for use. This should be kept in a brown bottle and away from the light, or a card may be wrapped around the bottle to keep the iodine solution from disintegrating.)

In making smears a drop of saline or water is placed on a slide. In this is emulsified a small amount of feces, with a needle or applicator, to reading opacity, covered with a cover slip, and examined first with the low power and then with the high dry (some people prefer to use the oil immersion lens). In such smears may be seen flagellates, amebae, ova, larvae of such worms as *Strongyloides*, etc. In young cysts the chromatoid bodies show up very clearly in the water or saline preparations. Several smears of each specimen should be examined with saline or water, as well as with iodine. In the iodine preparations iodine instead of water or saline is used and smears made and examined exactly the same as above. The iodine kills the protoplasm and stains the cytoplasm more or less yellow, the cyst and nuclear walls dark, and the glycogen dark brown. As a rule, the karyosomes stand out as refractile bodies. Thus one can study the number and type of nuclei, thickness of the cyst wall, type and position of the karyosome, etc. Iron-hematoxylin permanent preparations are unnecessary unless finer details are desired to study.

(c) *Examination of pus from liver and lung abscesses.*—In examining pus from liver and lung abscesses one should look for active *E. histolytica*, for they do not encyst in pus. *E. histolytica* are found in the walls of abscesses and not in the central necrotic material, so that care should be taken to procure material from the walls of such abscesses in examining for *E. histolytica*.

In case of doubt as to the diagnosis of an

intestinal protozoan, or if permanent preparations are desired for other reasons, the following method has been found to work the best: The material should be perfectly fresh, properly fixed, and at no time in the process should the slide or cover slip preparations be permitted to dry; as soon as that happens the preparations are ruined and should be discarded. Bloody mucus or soft stools need not be diluted, but hard stools should be diluted with saline before making smears. Smears may be made on slides or cover slips, using an applicator. Smears should be uniform and not too thick. If slides are used, the fixing fluid should be placed in staining jars. If cover slips are used, the fixing fluid is placed in Petri or evaporating dishes. Smears of the proper thickness are made and the cover slips are immediately dropped film side downward into the fixing fluid and are permitted to float for a few moments, then they are picked up with forceps and completely immersed face upward, using plenty of fixative and discarding it when through.

#### (d) *Procedure for Fixing and Staining*

(Iron-hematoxylin Method)

*Fixing solution*—Schaudinn's solution

Saturated solution of mercuric chloride in distilled water ..... 2 parts  
95% alcohol ..... 1 part  
To every 100 c.c. of this mixture add 2-5 c.c. glacial acetic acid.

Fix 10-20 minutes (30 minutes is better for cysts).

*Wash and harden*

50% alcohol for a few minutes.

To remove fixative 70% alcohol to which a few drops of iodine solution (alcoholic) has been added for at least 10 minutes.

The iodine removes the remaining  $HgCl_2$ .

95% alcohol (best for an hour or several days).

*Hydrate*

70% alcohol for a few minutes.

50% alcohol for a few minutes.

30% alcohol for a few minutes.

Distilled water.

*Stain* (Iron-hematoxylin method)

Mordant by placing in 2% aqueous iron alum (ammonium ferric sulphate) 2-6 hours.

Wash in distilled water for a few seconds.

Stain in 0.5% ripened solution of hematoxylin in distilled water 6-24 hours. (Make up solution, place in flask, plug with cotton wool, place in a warm place—in the sun, if possible—shaking from time to time. When the solution is "ripe"—a good brown color, namely, the hematoxylin is more or less oxidized to hematein, it is ready for use. This may require several weeks.)

Wash in distilled water.



Differentiate in 0.5 to 1% aqueous iron alum (never permitting the preparation to dry during the process.) Remove a slide, rinse in distilled water, and examine under the microscope for proper differentiation; the cytoplasm should be gray; the cyst, nuclear walls, as well as the chromatoid bodies and karyosomes, should be black when properly decolorized.

Wash in distilled water.

Then in running tap water for at least  $\frac{1}{2}$  hour in order to wash out all the alum; otherwise, the decolorization will continue.

Wash in distilled water.

#### Dehydrate

50% alcohol 5 minutes.

70% alcohol 5 minutes.

95% alcohol 5 minutes.

Absolute alcohol 10 minutes, 2 changes.

(Absolute alcohol and xylol, 50-50, 5 to 10 minutes.)

#### Clear (Xylol 5 minutes)

Mount in balsam.

(e) *Concentrating stools for cysts.*—A number of methods may be used in concentrating specimens for cysts when these are present in small numbers. One method is to take a small piece of the stool, emulsify it well in water or saline, strain through two layers of gauze, centrifuge at low speed 2 or 3 minutes, pour off the supernatant fluid, emulsify the sediment as before, and repeat the washing 2 or 3 times. Examine the final sediment with water and iodine. The small variety cysts fail to settle to the bottom.

(f) *Cultural methods.*—At times cultures are of great assistance in making a diagnosis because precysts, cysts, and atypical trophozoites become typical trophozoites showing the characteristic morphology and motility. However, the cultures must be made properly and carefully, using proper media, aseptic methods, and examining at the proper time. Cultures should not be relied upon entirely because our experience during the Chicago epidemic has taught us that only about 5 to 8% of the small variety *E. histolytica* grow in the culture medium used for the large variety. The presence of arsenic and other amebicides prevent *E. histolytica* from growing. Routine cultures are unnecessary in making a survey.

#### MEDIA

##### *Cleveland and Collier (Liver infusion agar)*

This medium is one of the best for practical diagnostic purposes. The medium consists of slants of liver infusion agar.

30 gm. liver infusion agar (Digestive Ferments Co., Detroit, Mich.)

3 gm. dehydrated sodium phosphate.

1,000 c.c. distilled water.

Dissolve, tube about 5 c.c. per tube, sterilize 15 lb. for 30 minutes, slant and keep in the ice box until shortly before using.

Before making inoculation these slants are overlaid with sterile serum saline 1-6. (Wassermann negative human inactivated serum, horse or rabbit serum, etc., may be used by taking 1 part of serum to 6 parts of NaCl, filtering through a sterile Berkefeld filter, incubating 24-48 hours to test sterility. If sterile, place in the ice box until shortly before using.)

The slants and serum saline should be placed in the incubator for a couple of hours before using in order to bring the temperature up to body temperature. Sterile precautions should always be used in making the cultures. Before making inoculations the slants are overlaid (sterily) with sterile serum NaCl, 1-6. A little sterile rice starch or rice flour may be added, but is not necessary. If the stool is soft, watery, or bloody mucus, a little is inoculated, using a sterile pipette or needle. If the stool is solid, a loopful is inoculated, macerating well by rubbing with the needle against the sides of the tube. Incubate at 37.5° C., and examine after 24 and 48 hours. Cultures should not be examined prematurely because occasionally *E. coli* grows in this medium, and in young cultures when rapid division takes place the nuclear structure may not be typical, the motility rapid; so that one may have difficulty in differentiating *E. histolytica* from *E. coli*. Occasionally subcultures are necessary in order to decide as to whether an organism is *E. histolytica* or *E. coli*. In 24-48 hour cultures, even when *E. coli* is present, it shows its typical characteristics—thick wall, sluggish motility, the entire organism seems to roll about in its wall. *E. histolytica*, on the other hand, has a thin wall and moves rapidly by means of a pseudopodium in an elongating, slug-like manner.

“Mature living *E. histolytica* cysts do not all hatch simultaneously nor at the same rate; some hatch quickly, others slowly. They usually begin to hatch after 2¼ hours' incubation. Cysts which do not hatch after 12 hours' incubation usually perish. Occasionally some hatch after 20 hours' incubation. Cysts begin to hatch when the chromatoid bodies and glycogen disap-

pear." C. Dobell, *Parasit.* 20, 4:383, 1928.

All other intestinal amebae do not grow as readily in this culture medium and cannot be maintained in culture as long as *E. histolytica*. When the other intestinal amebae grow in this culture medium they show their typical characteristics and should not be confused with *E. histolytica*.

In order to keep strains of *E. histolytica* going, make sub-cultures every 48 hours (using sterile precautions). A little sterile rice flour or rice starch is added to the liver infusion agar slants overlaid with serum saline before making the inoculations. To make the sub-cultures, use a sterile pipette with a good sized bore and transfer a little of the sediment, taking as little of the supernatant fluid as possible. Some strains of *E. histolytica* grow readily, while others grow with great difficulty.

#### *Locke Serum Medium of Craig*

This medium consists of a mixture of a modified Locke solution and inactivated human, horse or rabbit serum. The serum used should not be over 48 hours old.

#### *Locke solution:*

Sodium chloride .....	9.0 gm.
Calcium chloride .....	0.024 gm.
Potassium chloride .....	0.42 gm.
Sodium bicarbonate .....	0.20 gm.
Distilled water .....	1,000 c.c.
Filter and autoclave 15 lb. 15 minutes.	

#### *Medium:*

- 1 part inactivated (56° C. ½ hr.) serum to 7 parts Locke solution.
- Filter through a Berkefeld filter.
- Tube 10 c.c. per sterile tube.
- Incubate 24-36 hours to test sterility.
- Keep in incubator until used.

A slight amount of sterile rice starch or rice flour increases the efficiency of this medium.

(g) *Complement-fixation in the diagnosis of amebiasis and amebic dysentery.*—The technic is practically the same as that used in the standard method for the complement-fixation of syphilis in the United States Army laboratory fully described in Craig's "The Wassermann Test" (1920), except that the specific amebic antigen is used. The anti-human as well as the anti-sheep system may be used.

Any reaction below 3+ should not be considered diagnostic unless the patient has been treated. Upon treatment the complement-fixation becomes negative.

## THE MEDICAL MANAGEMENT OF AMEBIASIS

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The literature on amebiasis has been markedly increased in the last three years. Recent events, no doubt, have stimulated the interest in amebiasis and have done a great deal to augment our knowledge and to standardize the diagnosis of this disease. Our clinical laboratories have become more adept in stool analysis, and have developed more competent protozoölogists who are able to recognize and differentiate parasitic amebae in the stools of man. However, there is still much to be desired, from the clinicians' standpoint, as regards the management of amebiasis. In the treatment of syphilis, the Wassermann is an aid, not alone in diagnosis, but also in determining whether the patient has had adequate treatment. In malaria, the clinical picture, the cessation of the periodic attacks of chills and fever, and the disappearance of plasmodia from the blood stream are usually sufficient evidence that the disease has been eradicated. In amebiasis it is often difficult to be certain of the efficacy of treatment. The symptomatology is often indefinite and one cannot place entire reliance on negative stool examinations. The complement fixation test should be of great assistance but it has not been used extensively. Craig<sup>1</sup> has shown that this test is reliable, not alone for the diagnosis of the presence of *Entameba histolytica* in the stools, but also because the reaction disappears after eradication of the amebic infection. In 86% of the patients he examined, the reaction became negative within fourteen days after cessation of treatment. The remaining cases became negative 28 days after treatment. Unfortunately, the procedure is still too difficult to advocate its use routinely, though, according to Brown and Magath,<sup>2</sup> if improvements and simplifications are made, it promises to be an extremely useful test.

Despite these clinical handicaps, the medical management of the patient with amebiasis should have, as its ultimate goal, a "cure." One might

<sup>1</sup>Read before Joint Session of Sections on Medicine, Surgery, Public Health and Hygiene, 86th Annual Meeting, Illinois State Medical Society, Springfield, May 20, 1936.



ask what constitutes a "cure." As Mackie<sup>3</sup> has said, "A discussion of treatment must distinguish between a clinical cure or relief of symptoms, and a protozoological cure or complete eradication of parasites." The latter, of course, assures the former, though the converse is not necessarily true. As Mackie further states,

"Any therapeutic cure must have the achievement of both goals as its objective."

In the carrier group of patients, clinical cure is difficult to evaluate as many of these individuals have indefinite symptoms. Some patients have normal evacuation, while others have only an occasional loose watery stool; some

Resume of Drugs Used in Amebiasis

	Dose	Method of Administration	Total Daily Dosage	Total Dosage	Length of Course	Toxic Manifestations	Objections to Drug	Advantages, Results Obtained Presumably of Drug
Ipecac Emetine Group I	.325 gm (5 grains)	Orally, solid coated tablets.	10-15 tablets Nightly	100 tablets (32.5 gr)	10 days Usually one course.	Nausea - Vomiting Weakness -	Diet Restrictions Bed rest required	Displaced by Emetine More modern drugs
	.035 - .065 gm (5 - 1 grain)	Hypodermically (Subcutaneous)	.035 - .065 gm (.5 - 1 grain)	.70 gm (.2 gr)	1 gr. bid for 12 days 1 gr. bid for 4 days at weeks interval 1 gr. bid for 2 days.	Myocardial degeneration Tachycardia early stage Muscular weakness Fatal cases reported Toxic dose 4 gr.	Toxic reaction. Cumulative action	Specific action in acute amebiasis-dysentery group - amebic hepatic abscess - pleuro-pulmonary complications
	.2 gm (3 gr)	Orally - Capsule capsules	2 gm (3 gr)	24 gm - 36 gr	Useful one May repeat after 2 weeks if necessary.	As for emetine More nausea and vomiting.	See Toxic reaction for emetine	No advantages over emetine
Stoxarsol (Acetarsone) Group II.	.25 gm (4 gr)	Orally - tablet	1/2 to one tablet 35 gm (6 gr) 75 gm (12 gr)	2.5 gm (42 gr) 51 gm (84 gr)	2 courses - 1 week each, one week apart.	Arsenic poisoning Gastro-intestinal Symptoms. Erythema. Neuritic. Visual and Acoustic Symp.	Idiosyncrasy More toxic than other arsenicals Not advisable in acute hepatitis.	Displaced by safer Arsenicals.
	.25 gm (4 gr)	Orally tablet.	.25 gm bid. or 75 gm daily (12 gr.)	3 gm. (48 gr) to 52 gm (84 gr)	4 - 7 days. 2 courses at 7-10 day intervals.	Arsenic reaction Less than Acetarsone. Occasional erythema	Possible arsenic reaction Not advisable in hepatitis.	Eliminated regularly & slowly Starting immediately and eliminated by third day after cessation of treatment. Safe good amebicide
	.25 gm (4 gr)	Orally - (Capsules) Rectally - 200 cc - 24% soda-bicarb. with 1% Carbarsone. alternating nights	.25 gm bid. 5 gm (8 gr) 5 gm (8 gr)	5 gm (80 gr)	10 days & repeat in 10 days 10 days	None reported by Read-Hiderson. Leake & David	Possible arsenic poisoning. Not advisable in hepatitis	Highly recommended Especially used with emetine and vioform
Arsphenamine Group III	.3 - 4 gm	Intravenously	—	—	At weekly intervals for 4-8 weeks	—	Expensive & difficulty of administration.	Not used extensively. (Occas. in resistant cases)
	.25 gm (4 gr)	Orally	.25 gm tid or .75 gm.	75 gm (120 gr)	10 days Usually two or more at ten day intervals	Diarrhea	Displaced by Vioform	Reported satisfactory
	.25 gm. (4 gr)	Orally - tablets Enteric coated suggested	.75 gm (12 gr) tid	do	10 days Usually two or more at ten day intervals	Less than yatren.	Rare gastro-intest symp	Good results reported. Used with arsenicals & emetine
Bismuth Subnitrate. Group IV	Heaping teaspoon	By mouth in 1/2 soda water	9 hrs	for 20 days then bid indefinitely	—	Nitrite reaction	Carbonate of bismuth as effective	Not widely used except in Panama - by Deeks. Used as adjunct
	As above	By mouth	May be given as above	—	—	None noted	Not strong amebicide	As above
	.3 gm (4.5 gr)	Capsule by mouth Drug in olive oil	Bid or tid (60 gr to 50 gr)	4 to 10 gm (60 gr to 50 gr)	7 days Usually one	St. diarrhea	Not strong amebicide	Not extensively used.
Chaparrin-Amarog Auremetine	No limit	Infusion entire plant	Used orally	—	—	None	Not strong amebicide	—
	.065 gm (1 gr)	Orally	4 daily (25 gm or 4 gr) on Alternate days. for 1 week.	For total dosage 25 to 35 gm (40 to 60 gr)	—	Contains emetine None recorded	Not recognised as strong amebicide	—

Figure 1.



have periods of mild diarrhea, alternating with constipation. Other patients have increased flatulence, vague abdominal pain, occasionally simulating peptic ulcer or even mild cholecystitis. It is uncommon in this group to find ulceration in the lower rectum or recto-sigmoid. There is, however, sufficient evidence in the literature that even in this group definite ulceration exists in the colon or lower ileum. It would seem then that greater attention should be directed towards the eradication of amebae from the patients in the asymptomatic group. The acutely ill patient will usually have sufficient treatment and will be followed to a "cure," for both the physician and patient are fully aware of the seriousness of the illness; but the carrier is more likely to be treated haphazardly and to disregard adequate treatment and satisfactory follow up. He, therefore, becomes a greater hazard to society and continues to spread infection to others. He is also in potential danger himself as regards an acute dysentery, hepatic involvement, or other manifestation of acute amebiasis.

It is with these thoughts that one approaches the medical management of amebiasis, realizing that, even with all the drugs at our command, certainty of the eradication of amebae from the stools cannot always be assured. The treatment is not a specific one, and the clinician must vary the drugs to secure a high percentage of therapeutic cures.

Despite the clinical handicaps, the results of treatment of amebiasis as reported in the literature are quite satisfactory. In a series of 500 cases seen in the last fifteen years, Brown<sup>4</sup> reports apparent final cure in 91.1%. The treatment (in this series of patients) consisted largely of emetine and treparsol, though drugs

of the oxyquinoline group and carbarsone were used in a large number of patients.

Reed and Johnstone<sup>5</sup> report a series of 63 cases in whom very satisfactory results were obtained with carbarsone and vioform. Thirty-one were treated with vioform and three (9.6%) remained positive after eight, ten, and sixteen months respectively. Thirty-two cases were treated with carbarsone and all remained negative.

Thonnard-Neumann,<sup>6</sup> using di-hydranal in 28 carriers, reports good results in all but seven.

P. Mühlens,<sup>7</sup> over a period of eight years, used yatren by mouth and reports cures in from 70% to 100% of all patients treated.

There has been a great deal written as to the action of the various drugs, the question being whether the drug acts upon the parasite within the tissue of the host, or as it lies free in the fecal current. Deutsch<sup>8</sup> believes that emetine acts through the blood stream and is excreted by the kidneys, and is, therefore, more effective on amebae in the blood stream and in vascular organs such as the liver. It is not as effective on cysts, because of its low concentration; just as anthrax spores are more resistant to antiseptics than B anthrax itself. The universal approval and use of emetine in amebic hepatitis and hepatic abscess would appear to warrant such a conclusion.

Other authors believe that certain drugs act more specifically on the amebae in the bowel and advise the use of drugs placed directly in the colon either by enema or by insufflation. Anderson and Reed<sup>9</sup> recommend administration of some of the arsenicals by rectal injection, particularly carbarsone. Soper<sup>10</sup> believes that frequently carriers develop secondary ulcers just

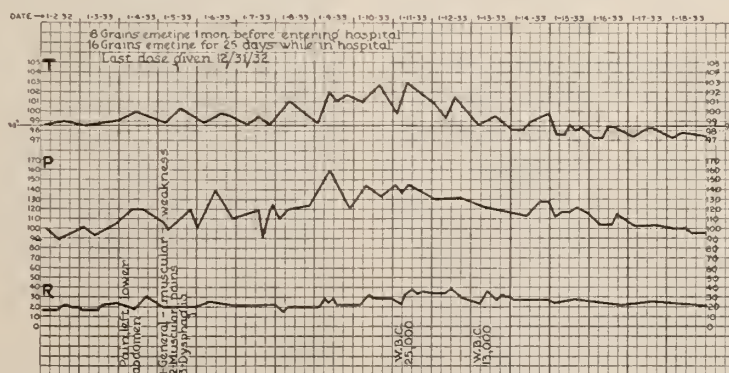


Figure 2. Chart showing toxic reaction of emetine.

above the anal sphincter, and that a connective tissue barrier forms preventing emetine from reaching the amebae. Therefore, in addition to using emetine intravenously, he gives vigorous proctoscopic treatment by insufflation of a powder of calomel and bismuth subcarbonate.

However, we do not have accurate knowledge of the specific action of the various amebacides. Toxic reactions have been reported after the use of emetine, stovarsol, treparsol, carbarsone, and others, so that no doubt all are poisonous to protoplasm of both the host and the parasite. A knowledge of the toxic reactions of the drug used is necessary to the proper and cautious

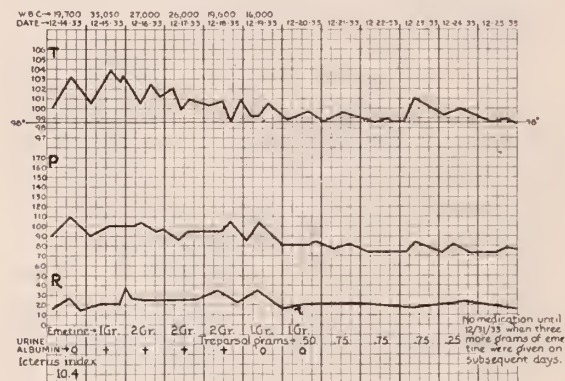


Figure 3. Chart showing response to emetine therapy in patient with hepatic involvement complicating amebiasis.

management of amebiasis. It would appear then that a drug should not be discarded if occasionally, even on proper dosage, toxic symptoms occur.

The drugs most frequently used in the management of amebiasis can be classified in the following groups.

#### 1. THE IPECAC GROUP. (See Figure 1).

Ipecac, used for dysenteries by the natives of Brazil, was first advocated for use in amebiasis by Simon<sup>11</sup> and Dock<sup>12</sup> in 1909. Salol-coated pills, containing five grains, were administered at night in doses of from ten to fifteen pills, for a total dosage of one hundred. Ipecac is of value in the treatment of amebiasis but because of the difficulties associated with its use, the nausea and vomiting, and the introduction of more modern drugs, it has been generally discarded.

Emetine, the alkaloid of ipecacuanha, introduced by Rogers and Vedder<sup>13</sup> in 1912, has had perhaps the widest and most universal use of all amebacides. It is generally accepted that

of the alkaloids of ipecac, emetine is superior to the other amebacidal alkaloids, cephaeline and psychotrin. Its action on the acute manifestations, particularly on amebic hepatic abscess, is rather spectacular. In fact, since its introduction, death from amebiasis has become rare. However, of late, emetine appears to be a much criticized drug, both because of its toxicity and because of the fact that such men as Craig<sup>1</sup> and Willner<sup>14</sup> state that even with increasing doses, the percentage of permanent cures is exceedingly low.

The toxic dose of emetine is given by various authors as over .06 gram (1 grain) daily for twenty-one days, or 1.37 grams (21 grains). Most clinicians give from 1/2 to 1 grain daily, though some give 1 grain twice daily for periods of four days. Brown<sup>4</sup> uses, as a rule, for an average dose .78 gram (12 grains) subcutaneously over a period of four weeks. This is given in two courses of 8 grains and 4 grains, about ten days apart. Emetine injected subcutaneously is much less painful than when injected intramuscularly and appears to be just as effective.

One employing emetine must be fully aware of its toxic symptoms and able to detect these promptly, as it has a cumulative action. Its toxic effect appears to exert itself upon the heart muscle producing a myocardial degeneration which manifests itself clinically by an increase of the pulse rate. In one case which came under observation, after 24 grains of emetine had been administered over a period of approximately sixty days, the heart rate rose as high as 160. The pulse became weak and the electrocardiogram showed inversion of the T wave in all leads. The patient developed marked muscular weakness, confined particularly to the legs. Difficulty in swallowing was also noted and rather suddenly there developed a large painful mass in the rectus muscle. This mass subsequently disappeared and was thought to be a hematoma. The patient also ran a slight fever. The diarrhea, so often noted in emetine toxemia, did not come on until some days after the tachycardia. The heart rate remained rapid for some weeks after the initial reaction and the patient did not regain strength for months. (See Figure 2).

Emetine-bismuth-iodide, a combination of 29% emetine, 12% bismuth, and 58% iodine



was introduced about 1915, particularly for treating carriers and resistant cases of amebiasis. As it contains emetine, it has the same toxic reaction as emetine when given in too large doses. In addition, it frequently causes nausea and vomiting that become so severe that further administration of the drug has to be stopped. It is administered by mouth in gelatine capsules of 0.2 gram (3 grains) per dose each night after the meal for twelve consecutive days. After an interval of a week or two, the course may be repeated if necessary.

## 2. THE ARSENICALS. (See Figure 1).

The second group of drugs used in the treatment of amebiasis is the arsenicals: acetarsone, treparsol, arspheamine, and carbarsone.

Acetarsone (acetyl-amino-hydroxy-phenyl-arsonic acid), introduced originally for the treatment of syphilis, has been used quite extensively in amebiasis. It is also known as stovarsol. It contains about 27.2% arsenic.

Treparsol (amino-oxy-phenyl-arsenic acid) was introduced about the same time as acetarsone. It contains slightly more arsenic (28.75%) than acetarsone. While acetarsone and treparsol are mentioned interchangeably in the literature, it has been shown that acetarsone is eliminated more irregularly than treparsol. Therefore, the percentage of toxic reactions is greater with acetarsone than with treparsol. Willmore and Martindale<sup>15</sup> believe that an idiosyncrasy to acetarsone exists in certain individuals, especially after repeated courses. As treparsol is eliminated more slowly and regularly it possesses advantages over acetarsone. Elimination of treparsol begins one day after its administration and is completed by the third day after cessation of treatment. In addition, treparsol is decomposed in the bowel and forms soluble salts which act directly on the parasites in the intestines. The dose of these drugs is .25 gram (4 grains) usually given two to three times a day for periods of four days to a week, and repeated after a week's interval. The toxic reactions reported following the use of acetarsone are: toxic erythema, peripheral neuritis, vomiting, diarrhea, visual and acoustic disturbances. However, with treparsol one sees only an occasional case of toxic erythema, though Brown<sup>4</sup> reports one patient with nausea and vomiting after taking four doses. I have, in my experience, noted

some tendency to diarrhea and one case of erythema which lasted but a few days.

Flandin,<sup>16</sup> who combines treparsol with emetine, gives a course of emetine for the first week and then, for one to two months, gives a course of treparsol .25 gram by mouth four times daily on the first four days of each week. He reports 80% improvement in his cases.

Carbarsone (4-carbamino-phenylarsonic acid) which was introduced by Reed, Anderson, David and Leake<sup>17</sup> in 1932, contains 28.85% arsenic. These authors contend it is less toxic than acetarsone or treparsol and a better amebicide. In their hands, they have seen only one incidence of toxic reaction, in a patient with an acute hepatitis. Carbarsone is usually given by mouth in gelatine capsules of .25 gram (4 grains) twice daily for ten days, and in resistant cases Anderson and Reed<sup>9</sup> suggest the use of carbarsone rectally. They propose first cleansing the bowel by irrigation, then following with the instillation of 200 cc. of 2% sodium bicarbonate solution containing 1% carbarsone. The retention enema is retained overnight. Treatment is repeated until at least five enemata are given on alternate nights.

Arsphenamine has been used by some clinicians in resistant cases with quite satisfactory results. This is used in the form of neoarsphenamine, four to eight injections of .3 gram being given at weekly intervals. The chief objections to it are: expense, difficulty of administration, and toxicity.

## 3. THE OXYQUINOLINE GROUP. (See Figure 1.)

The third group of drugs is the oxyquinoline group.

In 1921 Mühlens and Menk<sup>18</sup> introduced yatren as an amebicide. Yatren chemically is sodium hydroxyquinoline sulphonate containing 26% to 28% iodine. The drug is sold in this country as chiniofon. It is also called anayodin. The latter has received much favorable comment as an amebicide from O'Conner and Hulse.<sup>19</sup> They report 51 cases, 49 of whom, examined two to six years after treatment, showed negative stools. Yatren is used by some authors both orally and rectally. The dose is .25 gram tablets by mouth and a rather large number are required. The dose frequently causes some diarrhea after the second and third day of treatment. The action of the drug is a direct one and depends upon the iodine content. Because



of this, Craig,<sup>1</sup> and O'Conner and Hulse<sup>19</sup> are of the opinion that it is not effective in liver abscess. Anayodin (a proprietary name for chiniofon) was not accepted by the Council of Pharmacy and Chemistry of the American Medical Association.

Vioform (iodochlorhydroxyquinoline) has been available since 1933, and it would appear that there are fewer reactions and less diarrhea than with yatren (chiniofon). David, Johnstone, Reed, and Leake<sup>20</sup> investigated some eleven halogenated hydroxyquinoline compounds and concluded that vioform is the most promising of the group, with the exception of di-iodohydroxyquinoline which is still under investigation. The dosage for vioform as used by these investigators is .25 gram three times daily or .75 gram per day for a 75 Kg. person for ten days. A second course is given after a rest period of a week or ten days. The above authors found no signs of toxicity nor any unpleasant symptoms in any patient. Forty-seven cases were treated and actual cure was obtained in 38, as determined by repeated stool examinations.

Anderson and Reed,<sup>21</sup> treating 60 individuals with vioform, noted in three instances some type of gastric upset, such as: colic, diarrhea, nausea, vomiting, and headache. These authors are using enteric-coated pills instead of capsules in an effort to avoid further reactions. As in chiniofon (yatren), the action on the ameba is a direct one. The soluble hydrochloride of vioform is irritating to the mucous membrane in dilutions 1:500 and therefore, rectal use is not advisable. Because of a high iodine content vioform should be a valuable amebicide. However, too short a time has elapsed since its introduction, to form definite conclusions.

#### 4. MISCELLANEOUS GROUP. (See Figure 1.)

In the fourth, or miscellaneous, group of drugs are included: astringents and antiseptics, the bismuth compounds, heptylresorcinols, chaparro amargoso, kurchi bark, kurchi-bismuthus-iodide, and auremetine.

The bismuth compounds include the subcarbonate and subnitrate. Of the bismuth compounds the subcarbonate appears as effective as the subnitrate and is devoid of nitrite reaction. These drugs are frequently used as adjuncts, particularly with emetine and kurchi bark and kurchi bark alkaloids. Craig<sup>1</sup>, in discussing the subnitrate of bismuth, says that so

far as permanent cure is concerned, the results are uncertain.

Heptylresorcinol or di-hydranol, suggested by Faust<sup>22</sup> in 1930, has been used as an amebicide, as have others of the alkylresorcinols. This author reported satisfactory results in a small group of carriers. However, Mackie<sup>23</sup> in 1931, found the drug to have little effect on the *Entameba histolytica*. Leake<sup>24</sup> is of the opinion, "That further laboratory investigation of these drugs (the alkylresorcinols) is desirable." He says that in view of the fact that hexylresorcinol is less toxic and a better antiseptic than heptylresorcinol, it would seem that heptylresorcinol must be shown to be a better amebicide or else dropped from further consideration. This group of drugs has not been extensively used and one's judgment as to their value must be reserved for the present.

Chaparro amargosa is a plant whose habitat is Texas. The infusion of the entire plant is used both orally and by enema. This drug is only occasionally mentioned in the literature and apparently has not had wide usage.

Kurchi bark and its alkaloids have been used in the treatment of amebiasis for many years. Results have not been favorable and, in addition, a depressing effect has been noted upon the heart. Kurchi-bismuthus-iodide has largely replaced both the kurchi bark and its alkaloids. The dose of kurchi-bismuthus-iodide is .065 gram (1 grain) three times a day for periods of as long as four to six weeks. (Craig<sup>1</sup>).

In 1926, Willmore and Martindale<sup>15</sup> took an aniline dye, (the hydrochloride of tetramethyldiamion-diphenyl-ketonimine) called "auramine" and combined it with emetine and gave it the name of auremetine. This drug contains 28% emetine, 16% auramine, and 56% iodine. These authors obtained very gratifying results in forty cases, though in their acute cases they used, in addition, stovarsol and Panama bismuth. In the carrier cases they used Panama bismuth with the auremetine.

Numerous drugs have been mentioned from time to time, including quinine, mercury, silver salts, etc. Various other types of treatment have been suggested and tried, such as the de Rivas method of irrigating the colon with water at temperatures between 50-55 degrees centigrade, using various solutions—yatren, copper sulphate, etc. Brown<sup>4</sup> mentions using kerosene by

enema in many of his patients during the month of emetine treatment. Craig,<sup>1</sup> however, feels that, with the exception of chiniofon, colonic irrigations are of little value in the treatment of amebiasis.

*Diet.* The importance of restriction diet in the treatment of amebiasis depends somewhat upon the type of infection. The earlier clinicians, using ipecac and other drugs, advised liquid and low residue bland diets. It is now rather universally accepted that in treatment of the carrier or mildly symptomatic group little attention need be paid to diet. In the acutely ill patient the diet is restricted and determined largely by the severity of the diarrhea.

There has appeared in the literature some evidence that diet is a factor in the severity of the infection and the ease of the eradication of the parasites. This is especially so in the tropics where it has been noted that those individuals who have been on a restricted and particularly high carbohydrate diet have a more virulent infection than those on a full diet or on one low in carbohydrates.<sup>25</sup>

In experimental animals Faust and Kagy<sup>26</sup> studied the effect of feeding ventriculin, liver extract and raw liver to dogs infected with *Entameba histolytica*. These authors found that liver extract and, especially, raw liver by mouth were beneficial to the host and appreciably arrested the amebic process. Raw liver, in certain cases, produced complete eradication of the organism. Ventriculin, however, was found to be consistently harmful to the host in that it not only failed to check the invasion of the amebae, but actually reduced resistance of the tissues of the bowel wall to secondary invasion of bacteria. These authors explain in part the beneficial effects of liver extract and raw liver as due to: first, a dehydration of the stool, with resulting encystment of the amebae; second, prevention of the invasion of bacteria and secondary infection; and third, neutralization of toxins produced by protein degeneration in the large bowel.

*Treatment of the Carrier.* In view of the relatively large percentage of our population harboring the *Entameba histolytica*, this group of individuals should receive adequate attention as to treatment and careful follow-up. It is only by attempting to fully eradicate the amebae from this group that the incidence of amebiasis will be lowered. It is generally agreed and

quite definitely shown that *Entameba histolytica* can be eradicated from the stools of these individuals by the administration of drugs from the arsenical and oxyquinoline groups without the use of emetine. Using drugs from both of these groups seems to give better results therapeutically. They must be given in adequate dosage, with repeated stool examinations for at least six months following treatment.

*The Treatment of the Dysentery Group.* In acute amebic dysentery emetine is the drug of choice and quickly controls the diarrhea. It can be given hypodermically in  $\frac{1}{2}$  to 1 grain daily until 12 grains are given, or its dosage may be divided into two courses of first eight and then four grains given a week later. The patient is also given treparsol .25 gram (4 grains) tablets three times daily for four days. This is repeated after a ten-day rest; but it would be best to modify the treatment with a course of vioform, .25 gram (4 grains) given three times daily for a week. Usually this will be adequate, but further treatment will depend upon the stool examinations. Carbarsone may be substituted for treparsol giving .25 gram or 4 grain doses twice daily for ten days, and repeating after ten days. Stools must be examined repeatedly for at least a period of six months.

*The Treatment of Amebiasis with Hepatic Abscess and with Pleuro-Pulmonary Complications.* Emetine in the treatment of hepatic abscess and in those cases with pleuro-pulmonary complications gives such spectacular results that it can be used almost as a therapeutic test for this condition. The same dosage can be followed as that used in the dysentery group of patients.

The most outstanding example of the value of emetine in this group is that of Ochsner and De Bakey<sup>27</sup> who analyzed 153 cases of whom 63, or 41.1%, died. Summarizing the type of treatment used, 56 patients were treated by open drainage and 27, or 48.2%, died. Twelve patients were treated by emetine and open operation and of these two died, or 16.6%. Thirty-seven were treated by emetine alone and of this group two died or 5.4%. Of the entire group of 153 cases, 49 patients received emetine with only four deaths or 8.1%. These authors are of the opinion that emetine is the specific drug in pleuro-pulmonary amebiasis and hepatic abscess.

Holmes<sup>28</sup> regards the treatment of acute hepa-



titis and hepatic abscess complicating amebiasis as a purely medical problem; and maintains that open operation is performed with an extremely high mortality. Aspiration, while less likely to result in secondary bacterial invasion, is almost counterbalanced by its own peculiar shortcoming, lack of adequate drainage. Holmes cites two cases with hepatic involvement that were successfully treated with the use of emetine.

One such case which came under my observation demonstrates the value of emetine. Four years previously, this patient, a male, thirty-six years of age, had complained of abdominal pain, fever, and constipation. X-rays of the colon showed a persistent defect in the cecum which was thought to be inflammatory. A leukocytosis of 19,000 was found. At operation a large edematous appendix was removed and the same edematous thickening was noted involving the ascending colon and cecum. Four years later he developed an acute pain over the right upper abdomen and a referred pain over the acromial process of the right shoulder. He subsequently developed fever and a rigid abdominal wall. Stool examination showed only one ameba that was not definitely identified. X-rays showed an enlarged liver with a raised right diaphragm. Sections of the appendix, removed four years previously, were obtained and amebae identified in a mass of mucus lying in the lumen. Ulceration of the mucous membrane was seen and amebae identified infiltrating into the wall of the appendix. Fever rapidly subsided on emetine therapy and the patient made an uneventful recovery. (See Figure 3.)

Royster, Haywood, and Stanfield<sup>29</sup> advise repeated aspirations of an amebic hepatic abscess and the injection of emetine, both intramuscularly and locally into the amebic abscess. They report one case and, in conclusion, quote from Carson's *Operative Surgery* (1924) a paragraph written by G. Grey Turner which states that while some abscesses can spontaneously recover, the one essential is to saturate the circulating lymph with emetine.

According to Craig,<sup>1</sup> aspiration gives good results when combined with emetine therapy, but open operation for these complications of amebiasis is hardly justified except in those cases

where secondary infection is present, and then only after adequate emetine therapy.

It is the general opinion that amebicides, such as one of the arsenical or oxyquinoline group, should not be used in amebic infections of the liver, at least in the acute state. However, after treatment with emetine, when the hepatic and pulmonary complications have subsided, the amebae present in the intestines should be cautiously treated by a drug of either the arsenical or oxyquinoline group.

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Figure 1. Resumé of drugs used in amebiasis.

Figure 2. Temperature chart of patient with emetine intoxication.

Figure 3. Temperature chart of patient with hepatic abscess showing action of emetine.

## SURGERY IN AMEBIASIS

GATEWOOD, M. D., F. A. C. S.

CHICAGO

*"Every chirurgeon ought to be learned and that he knows his principles, not only in chirurgie but also in phisicke that he may better edifie his chirurgie."*—Thomas Vicary (1577).

This statement of old Sir Thomas might just as well have been written in 1936, after a study of some of the errors of commission as well as those of omission in the surgery of amebiasis.

Counselman and Lafleur,<sup>1</sup> in 1891, first described the pathologic lesions of amebiasis and differentiated them from those of bacillary dysentery. The action of *Entamoeba histolytica* is fundamentally the same in all the tissues that it invades. This action is dependent upon mechanical invasion by means of pseudopods and a toxin acting directly on the host. Having penetrated the epithelium of the intestine, the amebae advance along the basement membrane or penetrate it near the surface of the mucosa to enter the stroma beneath the glands. Eventually they multiply and break through the muscularis, spreading through the mucosa in all directions. The mucosa then becomes greatly thickened and edematous. Temporarily, the muscular coats

offer a barrier, but when invaded, the subserous tissues become water-logged and the serosa is covered with fibrin. This may lead to adhesion formation with subsequent obstruction, or to perforation with local or general peritonitis.

Grossly, three types of lesions are observed:

1. shallow ulcerations surrounded by a narrow ring of hyperemia,
2. a diffuse granular appearance of the mucosa with visible ulceration, and
3. sharply circumscribed nodular projections of the mucosa, between which are seen small depressed yellow openings surrounded by hyperemic rings.

These openings lead into cavities containing a gelatinous material. The more extensive lesions usually produce permanent thickening, rigidity, and often stenosis. Localized lesions are found most frequently in the large bowel where stasis normally occurs, i.e., the cecum, ascending colon, rectum, and sigmoid, the transverse colon being the least commonly involved. Amebic involvement of the appendix alone is occasionally seen, but usually is only a part of cecal involvement. Where the appendix is the site of the chief lesion, it is tumified and contains characteristic small ulcers. Clark<sup>2</sup> states that the symptoms are those of acute or chronic appendicitis of bacterial origin except that the leucocytosis is slight unless perforation has occurred.

Miss B. J. (Case No. 285295), a professional dancer, entered the Presbyterian Hospital July 11, 1933. She gave a history of diarrhea beginning a week previously, with three to seven stools daily. The diarrhea ceased in three or four days on the usual medical management but cramps continued and her temperature varied from normal to 102° F. Two stool examinations, made before admission, were negative for amebae. On examination the patient was a somewhat slight young woman with no noteworthy findings excepting marked tenderness in the right lower quadrant, some muscular resistance, but no definite mass. Leucocyte count was 30,000, having been 20,000 the day before admission. Stools contained some chemical blood, but no amebae were found. Bimanual examination under gas anesthesia was somewhat unsatisfactory but one could fairly well exclude a pelvic infection, and there seemed to be a mass in the cecal fossa. Operation was advised with the diagnosis of appendicitis with spreading peritonitis. On opening the abdomen, the peritoneum was found to be injected, edematous and there was turbid fluid between the loops of the intestine. The cecum was distended and dark red. The wall was thick and almost leather-like. The appendix, which was retroceally placed, was removed with some difficulty owing to the edema of the

<sup>1</sup>Read before the Illinois Medical Society, Joint Session of Section on Medicine, Surgery and Public Health and Hygiene, Springfield, Illinois, May 20, 1936.

<sup>2</sup>From the Department of Surgery, Presbyterian Hospital, Chicago.

large bowel. The distal ileum was also somewhat edematous. The condition was recognized as amebiasis and emetine therapy was begun at once. In spite of the treatment, immediately following the operation the patient's temperature went to 105° F. and remained from 103° to 104° F. for four days, or until her death. She became profoundly toxic and died with the picture of general peritonitis. (Amebae were recovered from the stools post-operatively.)

This story has been repeated many times during the past five years. **At operation, the bowel**



Fig. 1. Showing multiple obstruction and distended loops of small bowel. Mr. J. N., 9-16-35.

is edematous, thickened and so friable that any operative procedure is followed by rupture of the bowel and general peritonitis. It is almost impossible to suture ameba-infested bowel and invagination of an appendix stump subsequently breaks open with extensive leakage. Spontaneous rupture with general peritonitis occurs but rarely, and conservatism with medical management has saved many lives. As an example:

Miss E. W. (Case No. 313863), a social worker, aged 25 years, entered the Presbyterian Hospital February 15, 1936, complaining of severe pain through the whole abdomen which began three weeks previously and lasted for two and a half days. There had been pain in the right lower quadrant from the onset, some nausea and vomiting, and a slight tendency to diarrhea. Her local physician made the diagnosis of acute appendicitis, but as the condition seemed to be subsiding, he advised further waiting before removal of her appendix. As the pain had continued, the patient came into the hospital for appendectomy. On admission there was little to add to her history except that her bowels were always regular prior to the onset of her present com-

plaint and that the slight diarrhea persisted for only two days. On examination, there was a very localized area of tenderness in the right lower quadrant with slight muscle spasticity and no palpable mass. Her temperature was normal. The leucocyte count was 16,450, of which 66% were polymorphonuclear leucocytes. Seven stools were all soft formed, and negative for blood. No amebae, cysts or pus were found in direct smears, but cultures were positive for *E. histolytica*. On emetine and carbarsone therapy the patient recovered very promptly.

There are a number of other intestinal complications which tax the diagnostic acumen and technical ability of the surgeon. One of these is the development of obstructive symptoms either with or without a mass.

Mr. J. N. (Case No. 309395), a 52-year-old white male, entered the hospital September 15, 1935. He stated that two years previously he had been ill with amebic dysentery and had improved rapidly under treatment. About a month before admission, he noticed a recurrence of alternating constipation and diarrhea. Ten days previously, he began to have epigastric cramp-like pains which seemed to travel across the abdomen and which were relieved if flatus could be expelled. He had been checked up in New York two weeks before admission and no amebae were found although he had been given vioform capsules (iodo-chlor-oxy-quinoline) of which he had taken twenty just prior to admission. On September 14, the patient became distended and



Fig. 2. Amebic infection of abdominal wall secondary to cecostomy. Mr. J. N., 11-26-35.

vomited. Abdominal cramps increased in severity, coming every few minutes and lasting a minute or two. The patient had lost ten pounds in the preceding month.

On examination, he was somewhat undernourished. The abdomen was uniformly distended and the abdominal wall was tense. There was a great deal of gurgling in the upper abdomen. Although the abdomen took on changes of form, no definite peristaltic waves were seen. His temperature was 99.2° F. and the leucocyte



count was 13,600. X-ray on admission showed greatly distended loops of small bowel such as one finds in acute intestinal obstruction. (Fig. 1) Fluoroscopic examination revealed a napkin-ring type of deformity at the junction of the sigmoid and rectosigmoid, suggesting malignancy. However, there was also a filling defect in the sigmoid (A) and the roentgenologist noted that the appearance of two defects would lead one to suspect an inflammatory or scar tissue obstruction rather than malignancy. No amebae were found on smear or culture at this time. Owing to the high grade intestinal obstruction, an exploratory laparotomy with probable colostomy was decided upon.

At operation, September 16, 1935, the loops of the small bowel and the colon were greatly distended. There was considerable slightly turbid free fluid, and in the region of the sigmoid there was a small annular constriction about 2.5 cms. long. The colon was thick-walled and injected. A cecostomy was done with some difficulty owing to the friability of the intestine. The appendix was as large as one's index finger. The patient had a rather stormy convalescence but gradually gained strength and weight. The cecostomy wound, however, became ulcerated at its margin and granulation-like tissue was noted on the skin. (Fig. 2) This area increased rather rapidly producing sloughing. It bled readily and was covered with a sort of tenacious grey material in which numerous motile erythrocyte-containing amebae were found. On emetine injections and 1% yatren (Chiniofon) applications, healing took place very rapidly. The patient returned to his home in New Jersey and a letter from his doctor in New York, dated May 2, states that the strictures have greatly improved. "His bowels are moving normally and his general condition is that of a well man."

While he probably does not have a carcinoma, there are in our records two cases of carcinoma of the large bowel with concurrent amebiasis. One of these patients was treated for a considerable time for amebic dysentery and was subsequently found to have an inoperable carcinoma. Where a large amebic granuloma occurs in a patient past forty, with some obstructive symptoms, it may be exceedingly difficult to differentiate the condition from carcinoma, and a number of resections of amebic masses of the colon have been reported.<sup>3</sup> The defect, as visualized by the x-ray,<sup>4</sup> is usually more extensive and is often accompanied by other secondary deformities, but may be identical with that seen in carcinoma, especially in the cecum.

Another complication which this patient may still have is a late stricture of the sigmoid. Such a case is illustrated by the following history:

Miss G. W. (Case No. 290203), aged 23 years, entered the Presbyterian Hospital January 1, 1934. She gave the history of diarrhea beginning suddenly six years previously and lasting for about two years. She

has had frequent similar attacks since then, until nine weeks ago when she had her stools examined and numerous amebae were found. Following the use of emetine and carbarsone, there was very rapid improvement. On admission to the hospital she was having great difficulty obtaining bowel movements.

On examination, the patient was undernourished. There was moderate tenderness over the entire abdomen with some rigidity. On rectal examination, a stricture which would not admit the finger-tip, was found four and one-half inches from the anus. Laboratory examination: Blood: hemoglobin, 70%; W. B. C., 7,120. Seven stools were positive for blood, some had mucus, and most contained amebae. A right rectus incision was made and an ileostomy done after suturing the proximal and distal limbs of the terminal ileum together in order to insure a complete diversion of the fecal current. The patient improved very rapidly after the operation. Even where the mass disappears and the patient's stools become ameba-free fibrous stenosis may require surgery to relieve the mechanical symptoms.

Another complication of amebiasis which may require surgery is represented by the following history:

On August 21, 1935, an internationally known opera impresario (Case No. 307773), entered the Presbyterian Hospital on the service of Dr. Irons. He brought with him a letter from a St. Louis physician stating that in all probability he was suffering empyema of the gall bladder and that immediate surgery had been urged but had been refused. In support of his diagnosis, the doctor sent some cholecystograms which showed no filling of the gall bladder. On admission, the patient complained of tenderness in the right upper quadrant, chills and fever. He stated that he had been in good health most of the previous 49 years of his life, but that for the past six weeks he has not been quite up to his usual self. He had first noticed tenderness in the right upper quadrant which was not at all severe, and was not accompanied by any sharp pain, but which was persistent. Three weeks previous to his entrance, following a dinner at which there had been more than the usual amount of imbibing, he developed a severe headache, and awoke the following morning with a fever of 103° F. A few days later he developed a sudden sharp pain in the left upper quadrant, well localized and soon disappearing, leaving no untoward effects. Following this he had several similar attacks none of which was related to eating or bowel movements. A week before admission, he had a severe chill followed by a high fever. There had been no nausea or vomiting. His stools had always been normal in color and consistency. Except for the fact that he had consumed the equivalent of a pint or more of whiskey daily for twenty years, his past history was unimportant.

Physical examination revealed no noteworthy changes except in the abdomen. The liver extended three fingers below the right costal margin. Its surface was



smooth, hard and tender. Both lobes were considerably enlarged, the right more than the left.

After admission to the hospital, the patient had several chills, his temperature going to 104° F. His leucocyte count never exceeded 13,600. Proctoscopic examination showed normal rectal mucosa. Stool examination revealed blood, pus and mucus, and motile *Entamebae histolytica*. Following the usual emetine therapy, the patient's temperature promptly became normal and the amebae disappeared from the stools. The liver swelling disappeared and the patient has again mounted the conductor's stand.

Such is the story of the all-too-common amebic abscess of the liver. Unfortunately the result is not always as dramatic or as happy. The frequency with which liver involvement occurs is difficult to determine although it is probably found much less often in the temperate regions than in the tropics. Craig<sup>5</sup> thinks that in this country the incidence does not exceed 5%. Males are affected several times more frequently than females—8 to 1 according to Ochsner and DeBakey.<sup>6</sup> Very few cases have been reported in individuals under 15, and only about 5% of cases occur after 50. The majority of patients are between the ages of 20 and 40. Excessive indulgence in alcohol, exposure, starvation and improper food, mental strain and traumatism over the liver all seem to exert a predisposing influence.

The morbid anatomy of amebic liver abscesses varies with the age and size of the abscess. The right lobe of the liver is involved much more frequently than the left. Craig found only nine solitary abscesses in 24 cases, and feels that the idea that amebic abscess is usually solitary should be abandoned. The wall of the abscess varies in thickness according to its age. Often it is irregular, shaggy and poorly defined, but a more or less dense fibrous capsule will be formed if the process continues long enough. The contents of the abscess, when uncomplicated by secondary bacterial infection, consist of thick, semi-fluid, reddish-brown or the so-called "chocolate sauce" material. Microscopically this is composed of shreds of necrotic liver tissue, degenerated liver cells, leucocytes, blood and motile forms of *E. histolytica*. If a secondary infection has occurred, the contents may be yellowish or a combination of the above picture with pus.

Symptoms vary greatly with the individual. While the absence of a history of diarrhea may be misleading, it should be remembered that Ochsner and DeBakey found that 41% in a

series of 318 collected cases gave no history of previous diarrhea. Although liver abscess is usually seen within two months after ulceration of the colon, as many as 40 years may intervene between the primary infection and the development of the liver abscess. Pain, at first aching in character, later becoming piercing or stabbing, may be epigastric or referred to the shoulder or arm-pit. Sudden, severe pain occasionally occurs when an abscess ruptures. Craig noted that in 197 of 740 cases of amebic liver abscess, rupture occurred, demonstrating how frequently the condition has been overlooked by the clinician. Although Rogers<sup>7</sup> called attention to a pre-suppurative stage, which may last from two weeks to a month, most of the cases in this vicinity have been seen in the acute abscess stage. The fever, usually high in the acute stage, may disappear entirely in the long-standing case. The temperature as a rule is remittent, a decline being followed by profuse perspiration. Loss of weight and weakness are frequently progressive and marked.

*Physical Findings:* The liver is enlarged and tender. The abscess may produce enough enlargement to be visible externally. Restriction of the respiratory movements on the affected side, and rigidity of the abdominal muscles are usually noted. An increase in dullness on the affected side is frequently found due to the increased size of the liver or to a subphrenic abscess. X-ray findings are of great value, especially when they show an irregular contour of the liver surface or a bulging of the diaphragm, pointing into the lung field.

The most important laboratory findings are naturally the demonstration of the *Entameba histolytica* in the stools or in the material aspirated from the abscess. Leucocytosis, though marked, is not nearly as high as that which is characteristic of pyogenic liver abscess. The highest noted in ten cases in the Presbyterian Hospital was 19,300, the average being under 15,000. An increase in eosinophils, though definite, is usually not marked, and the percentage of polymorphonuclears is not increased.

The diagnosis usually is not difficult to make if the condition be kept in mind whenever a patient presents himself with an unexplained fever and tenderness in the region of the liver. In addition to the history, physical findings, blood-

picture and x-rays, aspiration of the typical debris will remove any shade of doubt from the physician's mind. In using the exploratory needle, care must be exercised to avoid the pleural cavity, and one should be prepared to proceed with surgical drainage should he find a pyogenic abscess.

The prognosis varies with so many factors that it is difficult to draw conclusions although Craig's mortality figures of 25 to 30% are probably fairly correct.

The treatment as already intimated, is primarily medical, and secondarily surgical. Open drainage has been abandoned by practically all tropical surgeons who have had a large experience with amebic liver abscesses, and they uniformly report an astonishing reduction in the mortality since adopting closed drainage. This frequently may be done by a large aspirating needle, although it may be necessary to employ a trocar on account of the thickness of the abscess contents. Aspiration must be done with care and always below the pleural space. It should not be attempted, except in case of emergency, until after medical treatment has been given a fair trial. Preliminary emetine therapy unquestionably lowers the surgical mortality. Lavage of the cavity is unnecessary and may be dangerous.

The most frequent complications are perforation into the subphrenic space with or without subsequent pleural or pulmonary pathology. I have seen one case of broncho-hepatic fistula and a number have been reported, always with a high mortality. Emboli from the lung may pass to the brain with a uniformly fatal termination, usually within a few days. Where the subphrenic space is involved, drainage by the posterior extra pleural route is preferable. Rupture of an abscess into the general abdominal cavity may be prevented by adhesion formation. Where no walling-off has occurred, the mortality is very high and drainage of little value.

Cutaneous amebiasis has rarely been reported except as an extension from a surgical fistula, such as a cecostomy or a drained liver abscess. Meleney and Meleney<sup>8</sup> describe a case of gangrene of the buttock, perineum and scrotum which was healed by a combination of radical excision, skin graft and emetine therapy, McMullin<sup>9</sup> cites a case of ulceration on the penis occurring in a Chinaman guilty of anal coitus.

Local cleansing therapy, irrigation with iodine solution combined with renewed emetine treatment will usually clear up the superficial ulceration.

In conclusion, human amebiasis is a definite disease entity, almost as protean in character as syphilis. Its treatment is primarily medical.

Its close similarity to other common pathological diseases, such as appendicitis, cholecystitis and carcinoma of the colon, may lead to serious, preventable surgical mistakes.

Its complications require expert surgical judgment and the utmost care in management.

Whenever surgical therapy is indicated, it should be preceded and accompanied by medical therapy.

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#### (DISCUSSION ON SYMPTOMS OF AMEBIASIS)

Dr. Richard H. Jaffé, Chicago: In opening the discussion of the papers on amebiasis, it may be of interest to discuss briefly the experiences of the *Entameba histolytica* in the human intestine. Protected by a resistant capsule the *Entameba* passes through the mouth, esophagus, stomach, small intestine, into the cecum and colon, down to the rectum. In the large intestine it loses its capsule, stretches out and starts to creep around. It secretes a dissolving substance, and with the aid of this substance forces its way into the intestinal wall. If the resistance of the host is high, the invasion soon is checked. There is an increased secretion of mucus and superficial ulceration. The mucus contains desquamated and degenerated epithelial cells and a few eosinophilic leukocytes. Single Leyden's crystals may be encountered. These changes usually do not cause any characteristic symptoms except for mild gastrointestinal manifestations. These are the



changes which occur in the carriers of *Entameba histolytica* and it seems that as far as amebiasis is concerned perfectly healthy carriers do not exist.

If the resistance of the host is insufficient, then the *Entameba* penetrates deeper and deeper into the intestinal wall. It passes beyond the mucosa and muscularis mucosae, into the submucosa, and evidently in the submucosa there are conditions that favor its propagation. Macroscopically, one finds nodular lesions in the colon which resemble furuncles. In the center of these nodules there is a small depression. The contents of the nodules is formed by a semiliquid material that is derived from the liquified tissues and is an ideal culture medium for the microorganisms which are always present in the intestinal content. Thus the specific amebic lesion soon becomes secondarily infected by the bacteria of the intestinal content and is transformed into an abscess that perforates into the intestinal lumen, and irregular ulcerations are formed. The ameba progress peripherally, soon to be followed by bacteria, and the ulcerations assume characteristic shape. The edges are deeply undermined with shaggy edges, and often fistulous tracts connect the ulcers with each other. In severe cases the whole intestine may become necrotic, and at autopsy it may then be impossible to remove the intestine intact, because as soon as one touches it, it breaks. The inner lining of the colon has become transformed into a dirty brown, shaggy material which resembles the skin of a buffalo. In some cases the changes extend above the ileocecal valve.

Wherever the *Entameba histolytica* enters living tissue it becomes surrounded by a clear space that results from the dissolving of tissue. In those cases in which the amebae force their way through the entire thickness of the intestinal wall and reach the serosa, peritonitis ensues which is the most serious complication of amebic dysentery. In other instances peritonitis is due to the perforation of the ulcers. I have repeatedly found at autopsy circumscribed amebic abscesses about the cecum, appendix or sigmoid colon. In these cases the perforation had led to a localized peritonitis that had been sealed off from the rest of the abdominal cavity.

Spreading by the lymphatics seems to be of little significance in amebic dysentery. The lymph nodes are seldom involved in amebiasis. If an involvement of the lymph nodes is found it is due to secondary infection. Evidently the amebae do not like the environment in the lymph nodes. In the blood vessels amebae are frequently found. Through the blood stream the ameba is carried to the liver. From what I have seen at autopsy, I am convinced that the great majority of liver abscesses are hematogenous. The amebic abscesses of the liver may be multiple or single. The latter is more common. The right lobe is involved in 70% and the left lobe in 20%, while in the remaining 10% both lobes are affected. In the early stages amebic lesions of the liver present themselves as areas of necrosis which are of moth-eaten appearance and dirty reddish brown in color. Progressing liquefaction

and secondary infection transform the necrotic area into a frank abscess.

One point I want to emphasize. In some instances liver abscesses do not cause enlargement of the liver, and external examination may not disclose any abnormal findings. Yet, on incision or needling a cavity of considerable size may be discovered in the center of the lobe. When the amebic abscess of the liver extends to the diaphragmatic surface, a subdiaphragmatic abscess is apt to develop. The liver abscess may also break through the diaphragm into the pleural cavity. A pleural empyema following perforation of an amebic liver abscess is, however, rare. In the majority of cases the lung becomes adherent to the diaphragm prior to the perforation. If perforation occurs the abscess then breaks into the lung. The perforation may lead to a lung abscess or to a bronchial fistula. Pus is expelled into the bronchi and the amebae can be demonstrated in the sputum.

One complication of amebic liver abscess which I have repeatedly seen and which has seldom been mentioned in the literature is the formation of pulmonary infarcts. These infarcts are secondary to a thrombophlebitis of a branch of the hepatic vein which is located near the liver abscess or into which the liver abscess has perforated. Keep in mind that the first clinical manifestation of amebic abscess of the liver may be a pulmonary infarct.

In other organs amebic abscesses are found occasionally, sometimes in the brain and in the kidney but these are extremely rare. In amebiasis there occur also lesions in the skin, particularly about the anus, about a colostomy or about the wound for drainage of a liver abscess. Again histologically we find in the skin the characteristic amebae surrounded by a clear space.

Dr. Eugene F. Traut, Chicago: Interest in amebiasis revived by the recent Chicago epidemic has led to meticulous examinations of stools in many patients whose symptoms might be even remotely related to those of amebiasis. So many publications have stressed the embarrassing and even serious errors due to overlooking of amebic infestation that the finding of amebae after a fervid search has been taken to explain the symptoms of many a baffling illness. The search for the underlying pathology often ended too soon with the triumphant finding of amebae in the stool.

Many a neurotic patient having sought for years the cause of a functional illness exults over the report of an inspired laboratory technician that *Entamebae*, presumably histolytic, exist in the patient's stools.

In my experience it would be well to halt this enthusiasm with the sober query, "Are the amebae really responsible for this patient's illness?"

Mr. H. had shown gross red blood in his stools for several weeks. He had also had some generalized abdominal pain. Complete examination including x-ray of the colon had resulted in the only positive finding of *Entameba histolytica* in his stools. No ulcers could be seen with the sigmoidoscope. Complete elimination of the amebae by the usual management did not stop the



slight but constant bowel hemorrhages. A later x-ray showed definitely a carcinoma high in the sigmoid.

Mrs. M. had a history of abortions. She had low abdominal pain. Her findings suggested subacute pelvic peritonitis. *Entameba histolytica* was constantly present in the stools. With the sigmoidoscope the bowel membrane was found to be uninflamed. Following the use of emetine and chiniofon the amebae disappeared and did not return. The patient's pain, now determined to be due to subacute parametritis, persisted.

A man of forty years dined frequently in loop hotels. He complained of generalized abdominal pain, fatigue and pallor. He used ethyl gas exclusively in his large car. Due to some defect in the mechanism there was such a constant escape of vaporized gasoline into the interior of his car that it was necessary to keep his car windows open. He had a moderate hypochromic anemia and the excretion of lead in his urine and feces was constantly increased to ten times the normal figures. On one occasion the feces sent for quantitative lead analysis were accidentally sent to the bacteriological laboratory. The bacteriologist found *Entameba histolytica* in large numbers. Examination of several more specimens of stool showed *Entameba histolytica* to be constantly present. The patient could not recall having had diarrhea. Pus or blood were never found in his stools. No ulcers were seen in the rectum or sigmoid. Emetine and chiniofon were given. The amebae were abolished without any improvement. The patient recovered when his plumbism disappeared.

A widow, 36 years of age, had complained of generalized abdominal distress for many years. She had taken cathartics for a long period. Although she had lived in a downtown hotel in Chicago during the World's Fair she had never had diarrhea. The stools were usually long and narrow. She had never seen blood in her stools. Her symptoms were always exaggerated by fatigue or nervousness. Her distress was relieved by belladonna and bromides. She complained of doctors never finding anything wrong with her. She disliked being called "nervous." Her stools contained large amounts of mucus but never showed pus. Proctoscopic examination showed no inflammation as high as eleven inches from the anus. When a zealous worker in the clinic of a large medical school finally was able to culture amebae from the stool the patient was triumphant. At last someone had found the cause of her complaints. She had now a just reason for being ill. Antiamebic medication did away with the organisms. This treatment caused an exaggeration of her symptoms. The patient did not have amebic dysentery. She had an "irritable colon" and the amebae were merely coincidental.

An unmarried woman of thirty-two had complained of abdominal distress to numerous doctors for many years. They had been unable to find anything organic to explain her symptoms. She had never had diarrhea nor noted blood in her stools. Repeated x-ray and proctoscopic examinations had shown no pathology. Being tense and anxious, the diagnosis of "spastic colitis" or "irritable bowel" seemed entirely fitting. *Entameba histolytica* were found to be constantly present

in her feces. She was made more miserable by the anti-amebic medication. Her stools show no amebae on slides or in culture. Her previous complaints recur with fatigue, emotional strain or failure to adhere to the prescribed diet.

*Summary.* I have described instances of carcinoma of the colon, pelvic cellulitis, lead poisoning and spastic colitis or irritable bowel with coincident *Entameba histolytica* in the feces. In each case the finding of amebae masked or drew attention from the pathological basis of symptoms. Such errors are avoidable by recognizing and properly evaluating the carrier state.

The same tendency to overlook essential pathology occurs with a positive result to any other clinical or laboratory test. I have seen uremia and even pregnancy overlooked on the x-ray demonstration of a niche in the duodenal cap of a patient complaining of vomiting. In endocarditis or tuberculosis a positive Wassermann has served to confuse a diagnostician too laboratory conscious.

It is granted that true amebiasis may be associated with any other disease. It must also be granted that *Entameba histolytica* may be found in functional diseases symptomatically and etiologically entirely unrelated to the discovered amebae.

The finding of *Entameba histolytica* must not terminate the search for other pathology.

## ALLERGY OF THE EYE, EAR, NOSE AND THROAT

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*Introduction.* For the last twenty years the discussion of anaphylaxis and allergy has become more and more familiar at medical meetings. While the foundations for the study were laid many years ago the real progress from a clinical point of view began during and just after the War. Men began to devote much time to this fascinating subject and clinics sprang up all over the country. Today there are allergy clinics in every large city of this country and many in smaller centers.

As the study began it concerned itself especially with hay fever and bronchial asthma but it was soon realized that allergy can strike almost any part of the body. The person who has allergic symptoms in one part of his body is apt also to have evidence of hypersensitivity in another organ. Thus, vasomotor rhinitis frequently precedes and accompanies bronchial asthma.

The diagnosis of hypersensitiveness is usually not difficult. In the first place, the patient fre-

quently has some other allergic manifestation; for example, if the complaint is asthma there is likely to be a history of previous eczema. Secondly, about 60% of the patients give a family history of some allergic condition, e. g., asthma, hay fever, urticaria, migraine, etc. In the third place, eosinophilia is a characteristic finding in allergy; there is usually an increased percentage of eosinophiles in the blood and equally important, there is also an increased percentage of eosinophiles in the secretions of the eyes, nose and bronchial tubes. This local outpouring of eosinophile cells is of utmost value as a diagnostic finding.

In the fourth place may be mentioned the protein sensitization, or skin, tests. In this connection I should like to state briefly my personal position in regard to the value of these tests. As most of you know, the value of skin tests is a subject for dispute. There are those who rely on skin tests almost exclusively; these individuals are handicapped, their results are poor because they are mere "skin scratchers," not clinicians at all; they are, in a sense, merely laboratory technicians. At the other extreme are the nihilists who condemn all skin tests; they, too, fail because they are not taking advantage of a very valuable diagnostic means. I class myself as a conservative, avoiding both extremes. I do skin tests, both cutaneous and intracutaneous, as completely as possible. In selected cases testing materials are placed in the nose or in the conjunctival sac. In contact dermatitis contact or patch tests are used. No matter what tests are used or what they show, one's common sense and one's clinical judgment must be exercised before a certain food or other substance is found to be the definite cause of a certain clinical condition.

It goes without saying that a searching history of the complaints of the patient is as essential in the care of allergic individuals as it is in those who are not hypersensitive.

#### ALLERGY OF THE EYE

The eye is a common seat of allergic manifestations. Itching, photophobia and lacrymation are outstanding symptoms in ordinary pollen hay fever. The early type of hay fever is due to the pollen of trees; a later season is caused by grass pollen; a late group of cases is due to pollen from weeds, especially ragweeds. These have been discussed so frequently that we shall here dismiss the subject of true pollen hay

fever with the statement that it is probably the most frequent cause of eye allergy.

Excluding the conjunctivitis associated with true hay fever there remain two other types of conjunctivitis for consideration from the allergic point of view. One of these occurs in spring and summer and is called "vernal conjunctivitis" or "vernal catarrh." It might well be called "seasonal allergic conjunctivitis." The other type is found at any time of the year and may be termed "non-seasonal (allergic) conjunctivitis."

*Vernal Conjunctivitis.* "Vernal conjunctivitis" is the fairly frequent condition and is characterized by an itching inflammation of the eyelids, associated with photophobia and lacrymation; mucous strands are usually present and the eyes tend to stick together in the mornings. The secretion usually contains eosinophiles. The onset varies a little but usually occurs on or before the first of May; it may or may not last until cold weather. It usually disappears entirely until the next year, but in some cases the follicles of the mucosa tend to remain inflamed after the season is over. Unfortunately, in a few patients there is a tendency for these follicles to persist as a more or less permanent structural change that looks like the cobblestones found in trachoma. In fact, trachoma has been frequently confused with vernal conjunctivitis.

Lehrfeld<sup>1</sup> reports the pathology of vernal catarrh as follows: the epithelium swollen and irregular, definite connective tissue proliferation, with sclerosis and hyalinization, glands full of eosinophiles and lymphocytes, and mast cells and eosinophiles throughout the stroma.

Wood<sup>2</sup> in his book on "Allergy and Immunity in Ophthalmology" points out that the pathology of vernal conjunctivitis has two forms. The first is similar to a phlyctenule, a form due to an allergic reaction of a sensitized conjunctiva to a specific allergen. The second form is characterized by connective tissue proliferation and cellular infiltration of the follicles, a reaction quite comparable to that occurring in chronic bronchial asthma and chronic eczema. The first form is, therefore, that characteristic of ordinary hay fever; the second that found especially in longstanding eczema.

Is vernal conjunctivitis an allergic condition? There is a difference of opinion on this point. Lehrfeld<sup>1</sup> reported that 10% of his patients with vernal catarrh also had other allergic manifes-



tations and in 21% there was a definite family history of allergy. Thirty per cent. of his 87 cases gave positive skin tests by the scratch method; eosinophiles were found in 40 of 69 cases. Townsend,<sup>3</sup> Mamoli<sup>4</sup> and Weinstein<sup>5</sup> report the frequency of associated hay fever, vasomotor rhinitis or bronchial asthma. Fort<sup>6</sup> reported 19 cases of vernal catarrh, all sensitive to pollen, 15 to spring pollens, 4 to fall pollens. Lemoine<sup>7, 8</sup> found positive pollen tests to 12 of 13 cases. I have seen several cases of vernal catarrh which gave positive cutaneous tests to pollen and which later developed hay fever. One of these had the cobblestone type of conjunctivitis and developed a severe corneal ulcer with subsequent opacity; for some time he was thought to have trachoma.

The results of treatment from the allergic point of view have not been very satisfactory. Fort<sup>6</sup> reported 15 cases with one cured and 13 improved. Other reports have been inconclusive. In my patient who developed the corneal ulcer, speedy improvement followed removal to a pollen-free room. Avoidance of pollen seems distinctly advisable in severe cases. If, for example, ragweed pollen seems to be the cause of a severe conjunctivitis with corneal ulcer the patient should either be confined in a room the air to which is supplied through a pollen filter or he should be sent to the far north.

Against the idea that vernal catarrh is allergic are the following points: Pascheff<sup>9</sup> found evidence that vernal conjunctivitis may be associated with latent pulmonary tuberculosis. Another argument lies in the fact that vernal catarrh frequently lasts a year or two and then disappears which rarely occurs in pollen hay fever. Then again, its appearance in late April or early May, when only the pollen of trees is in the air in this vicinity, demands that the cause, if pollen, must be a tree pollen, yet, skin tests, when positive, are usually positive for grass pollens, not tree. Thus, it may be stated that vernal conjunctivitis has not been definitely proved to be allergic. Skin tests should, however, be carried out in all cases.

*Non-Seasonal (Allergic) Conjunctivitis.* There is no doubt that there are many cases of conjunctivitis that are definitely due to sensitization to some substance other than pollen. The symptoms come on at any time of the year when there is contact with a specific allergen, such as house

dust, orris root, feathers, etc. Thus, Bab<sup>10</sup> reported 25 cases of allergic conjunctivitis, treated by desensitization with the specific allergen. Seven of these were complicated by hay fever, vasomotor rhinitis and bronchial asthma. Eleven cases responded favorably to desensitization to specific and non-specific substances. Woods<sup>11</sup> reported a case due to corn dust; Blake<sup>12</sup> one to cat hair; Balyeat and Bowen<sup>13</sup> a case due to feathers and another due to tomato, onion and egg with relief on avoidance of these foods. Parlato<sup>14</sup> reported a patient with corneal ulcers who gave positive skin and ophthalmic reactions to orris root, to which she was exposed daily in cosmetics; improvement followed a course of injections of an extract of orris root. Parlato emphasizes an important point, namely, that early recognition of hypersensitiveness in many cases of chronic conjunctivitis may help to prevent the formation of corneal ulcers and the subsequent impairment of vision. Roy<sup>15</sup> also reported a severe case of edema of the conjunctiva from orris root in a powdered shampoo.

Bedell<sup>16</sup> in his article on stereoscopic fundus photography has some beautiful photographs of two cases which he considers allergic. His first may be open to argument but the second case probably not as it followed an injection of tetanus antitoxin and the demonstrated retinal petechiae and edema immediately preceded the appearance of serum urticaria.

As far as treatment of seasonal and non-seasonal allergic conjunctivitis is concerned, it is important to remove the specific cause as far as possible, whether it be pollen, orris root, house dust, feathers or some other antigen. It would seem advisable also to attempt desensitization where complete removal of the cause cannot be carried out, as in pollen or orris root. Though the results of such treatment are not as yet known in sufficient numbers one has everything to gain and little to lose by trying such treatment.

For local treatment avoidance of light and various solutions and compresses are indicated. Dedimas<sup>17</sup> believes that the best treatment consists in injections of 1:2000 epinephrin solution subconjunctivally.

*Contact Dermatitis of the Eye.* In addition to conjunctivitis due to pollen and to other antigens there is another important group of eye conditions, those due to contact with various ir-



ritating substances. These cases are analogous to the ordinary contact dermatitis seen by the dermatologist. Patients with contact dermatitis are not allergic in the ordinary sense of the term; they have no special family history of allergy; eosinophilia is not characteristic; ordinary cutaneous and intracutaneous tests with protein extracts are negative; passive transfer cannot be accomplished as it can with hay fever or bronchial asthma. Contact dermatitis is, however, characterized usually by a positive test with the contact or patch test. This is done by laying the suspected material against the skin of the arm or back; in a day or two, or less, if redness and vesiculation occur a positive reaction is indicated.

Many cases of contact dermatitis of the eyes have been reported; cosmetics have been especially incriminated. Thus, Neuschuler<sup>18</sup> reported severe symptoms from the use of an eyelash preparation called "Rimmel" with relief on stopping its use and re-appearance of symptoms with subsequent trial in one eye. He also quotes cases seen by other men from application of henna and other substances used on the eyelashes. Rattner<sup>19</sup> had a case due to Godfrey's dye applied to the eyebrows and eyelashes; he also had one due to a wave lotion; another to a face lotion; and a fourth to a cold cream. Balyeat and Bowen<sup>13</sup> had a patient with an acute conjunctivitis due to "Lash Lure," and another due to a hair oil. Koutseff<sup>20</sup> reported one due to atropine solution dropped in the eye. Many other patients have had conjunctivitis from atropine. All of these patients were relieved on removal of the cause.

The problem is one of scientific detective work. A careful history plus patch testing are very helpful.

*Other Eye Conditions.* The question of whether cataracts may be due to sensitization is much disputed and time will not permit discussion. Likewise, the relation, if any, between sympathetic ophthalmia and allergy is very indefinite. Those especially interested would do well to consult Wood's monograph.<sup>2</sup>

*Angioneurotic edema* may strike any part of the body but seems to have a special predilection for the eye. It apparently rarely involves the throat. Its etiology needs careful study but a food history and diet trials are an aid. Skin tests are apt to be disappointing but should be tried. Common drugs like quinine and coal-tar products are frequent causes.

#### MENIERE'S SYNDROME

Recent work indicates conclusively that allergy is an important and perhaps the sole cause of Ménière's syndrome. The symptoms described by Ménière eighty years ago were thought to be due to a hemorrhage or effusion into the semicircular canals of the ear. Yandell<sup>21</sup> in 1933 had a male patient, 38, who had periodic attacks of intense vertigo, tinnitus, nausea and vomiting for fourteen years; the attacks came on suddenly and violently; the patient was sometimes hurled to the ground as though struck by a heavy object. He was even thought to be epileptic. He would be unconscious for a short time and vertigo and headache would then follow before the symptoms would finally cease. This patient also had urticaria. The family history for allergy was negative. He was always worse in crowded places, e. g., barber shops, theatres, dances, etc. He had had no previous ear trouble. Vision was almost normal. Skin tests showed a positive intradermal two-plus reaction to house dust and a four-plus positive test to a 1:500 dilution of orris root. These two reactions brought on severe headache, nausea and vomiting and the patient had to lie down to keep from falling; the symptoms lasted six hours. Desensitization to orris root was started, beginning with weak doses and orris root was avoided as much as possible. Improvement was so marked that subsequent visits to crowded places did not cause trouble. Yandell believes that the symptoms were due to an edema within the labyrinth and, as is well known, edema is characteristic of allergy. The edema, of course, could act as would a hemorrhage.

Malone<sup>22</sup> also reported a case of Ménière's syndrome in another man who had had urticaria and who also had his main trouble while in crowded places where exposure to orris root was inevitable. Orris root gave a four-plus intradermal test and desensitization by injections of gradually increasing amounts of orris root extract has brought about great improvement. On one occasion an overdose caused vertigo, headache and nausea; this fact strongly strengthens the presumption that contact with orris root caused the syndrome.

In addition to these two cases, Urbach and Wilder described the occurrence of vertigo of the Ménière's type associated with urticaria, angioneurotic edema and gastrointestinal symptoms following the injection of horse serum. The eat-

ing of pork re-excited the attacks; a milk diet and specific peptone preparations controlled the symptoms. A low intake of sodium in the food and administration of ammonium chloride by mouth has been found of aid.<sup>23</sup> Foldes<sup>24</sup> believes that Ménière's disease is due to a temporary local liquid retention or a disturbance in water and mineral metabolism.

From these data it seems logical, because of the serious nature of the condition, to have all cases of Ménière's disease subjected to a complete examination which should include a survey from the allergic point of view.

#### NASAL ALLERGY

In the few minutes left I can merely touch on the subject of allergy of the nose. A large percentage of patients seen in the practice of a rhinologist is definitely allergic. Just as the institution of patch, or contact, tests has revolutionized dermatological practice so will the routine examination of nasal secretions change the old methods of treatment. Hansel,<sup>25</sup> to whom great credit is due, in his book on "Allergy of the Nose and Paranasal Sinuses," just published, has studied the literature very extensively; he has examined nasal secretions of normal, infected and allergic individuals. The nasal secretions are gathered simply by blowing the nose on a waxed paper or cellophane handkerchief. After drying, the material is stained as for an ordinary differential blood count, using Wright's or Giesma's stain. The percentages of polynuclear neutrophils and eosinophiles are determined. Hansel points out that in normal nasal secretions cells are few; in infectious cases, as in the ordinary "cold," the secretions contain large numbers of polynuclear cells; whereas, in the allergic nose the eosinophiles vary from about 4 to almost 100%. If an allergic individual contracts an ordinary non-allergic rhinitis or "cold" the eosinophiles lessen or disappear temporarily only to return later.

The examination of nasal secretions should be a routine procedure. If you do this you will probably find that at least a third of your patients with nasal symptoms are allergic. If then you examine these individuals from an allergic point of view you will be placed in a better position to benefit your patients.

The question of nasal polyps is important. That they are closely related to allergy is indicated by the work of Kern and Schenk<sup>27</sup> who

found that all patients with mucous polypi gave a history of allergy and that eosinophiles predominated on histological examination of the excised polyps. Watkins<sup>28</sup> noted that nasal polyps disappeared as a result of appropriate therapy. While this is not an uncommon occurrence disappearance does not, of course, always occur.

Surgery of the nose in allergic individuals is indicated for severe infections or obstructions where more conservative measures have failed. All too frequently the results from surgery are but temporary; after a few months or less the symptoms and the local eosinophilia are apt to return. In addition, I have seen severe bronchial asthma occur repeatedly after nasal surgery; this possibility must be taken into account.

*Pollen Hay Fever.* Concerning ordinary pollen hay fever, the best treatment to date remains the injections of the appropriate pollen extracts. These injections should be given in larger dosage, I believe, than usually administered, with due regard to reactions. Bulk solutions are much the best as they can easily be adapted to suit the individual case. Thorough skin tests not only for pollens but also for foods, feathers, etc., are of great aid. Removal, for example, of foods which give positive skin tests helps the results of treatment. The perennial treatment of hay fever has become an established method. Its results are at least as good as those obtained by the usual preseasonal method; furthermore, it has been noted by many that patients who receive injections of a pollen extract throughout the winter seem to be protected to some extent from ordinary "colds."

*Ionization.* Before concluding let us consider the desirability of ionization of the nasal mucosa for hay fever and vasomotor rhinitis. There seems to be a wide difference of opinion as to its value. Following the treatment Alden<sup>29</sup> reports a complete return of the mucosa to normal but Hollender<sup>30</sup> states that ciliated epithelium is replaced by a non-ciliated cuboidal or stratified type without marked fibrosis. Hansel<sup>26</sup> states that the immediate effect of ionization is the formation of a serofibrinous exudate which may be removed in three to five days. The nasal secretion shows chiefly neutrophils with a few eosinophiles. After the complete disappearance of the exudate the mucosa looks dry with scanty secretion that shows some eosinophiles in spite of the relief of symptoms. Alexander<sup>31, 32</sup> believes the



relief obtained is due to a local non-specific desensitization similar to that obtained by the use of carbolic acid, trichloroacetic acid, diathermy or actual cautery. The relief of symptoms on both sides of the nose following ionization of one side further suggests this non-specific effect. From the immunological point of view Alexander has shown that when positive skin tests were obtained before ionization they persisted after ionization. Likewise, if the procedure of passive transfer demonstrated reagins in the blood these persisted after ionization.

Alexander concludes that hay fever patients ionized before the season do poorly; he believes better results follow injections of pollen extracts. Three of his hay fever patients who were ionized had relief from nasal symptoms but developed asthma for the first time. Parlato<sup>33</sup> also reported that following ionization two hay fever patients developed asthma for the first time. Both Alexander and Parlato, however, stated that in the group of patients with negative skin tests and with an absence of reagins in the blood, nasal ionization proved to be very effective; and Hansel seems to agree with this statement. Ramirez<sup>34</sup> ionized 100 cases of seasonal hay fever and 25 cases of perennial rhinitis and was much dissatisfied with his results in both groups. House and Gay<sup>35</sup> treated 20 individuals with allergic and non-allergic symptoms. Three out of five non-allergic cases of rhinitis were improved. In the remaining 15 the results were, for the most part, poor.

In contradistinction to the above, Alden<sup>29</sup> obtained complete relief in 63% of 416 uncomplicated hay fever patients; only 8% had complete failures. In 27 asthmatics he reports complete relief in 37%, with failure in 44%. Alden states that 80% of cases of vasomotor rhinitis received from 80% to 100% relief. Hollender<sup>36</sup> has been using zinc sulphate ionization for more than twelve years and reports good results in vasomotor rhinitis. In a later article by Hollender and Gorin<sup>37</sup> from 50% to 70% relief was obtained by zinc ionization in patients with vasomotor rhinitis. Warwick<sup>38</sup> reported that all but one of 40 patients have been entirely relieved of their symptoms for more than one year and 19 of them for more than three years. Among other methods of treatment phenol<sup>39</sup> and radium<sup>40, 41</sup> have been used; Bernheimer noted that the re-

sults of application of radium in perennial cases was good but that in 12 patients with seasonal hay fever failure resulted in all.

#### CONCLUSIONS

1. The eyes and the upper respiratory tract are especially prone to the disturbance of hypersensitivity.

2. Early recognition of possible allergy of the eye may prevent corneal ulcers and subsequent opacities.

3. Ménière's disease is probably allergic.

4. The study of nasal secretions in nasal cases should be routine. A high percentage of eosinophiles indicates allergy and treatment in such cases should be from both rhinological and allergic points of view.

5. The best treatment for hay fever is a series of injections of the appropriate pollen extracts.

6. The value of nasal ionization is still under dispute; its results in pollen hay fever usually are not good; in vasomotor rhinitis some workers report considerable success.

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### DISCUSSION

Dr. A. R. Hollender, Chicago: This timely and interesting paper is comprehensive in scope but leaves open for controversy a number of important points. I do not propose to argue them, but I should like to emphasize my point of view, first with reference to the diagnostic phase, and second, with the therapeutic aspects.

I have been struck with the variability of skin reactions from diagnostic tests, especially as concerns the sites of the body. In other words, misleading information from diagnostic skin tests has often led to a confusion in estimating the degree of hypersensitiveness because all the tests are usually made on one certain part, like the arm. When these same tests are performed elsewhere on the body a different picture presents itself. Alexander had emphasized this fact and has stated, for instance: "The degree of reaction varies at different sites of the body. When it is large on the back and abdomen, it is smaller on the arm and often negative on the leg. Finally, and this is discouraging, positive reactions occur that have no meaning whatever." Alexander aptly evaluates these findings when he says: "In view of these facts, positive skin reactions other than in hay fever must be regarded with caution, and negative reactions as by no means ruling out the allergens employed." It behooves us to regard diagnostic skin tests with less importance than we have in the past. Certainly we have learned that the interpretation of these tests and the correlation of this interpretation with the clinical facts are along the lines of more rational thinking.

We now appreciate more and more the fact that individuals are often sensitive to the bacteria of infection. This is a step forward, but alters little our therapeutic program. A patient with an acute or chronic maxillary sinusitis who is sensitive to the re-absorption of the pus in the sinus or in the nose, will not usually yield to allergic therapy whether by vaccine or other means, but requires rhinologic treatment to clear up the infection. The rhinologist has always recognized this and has repeatedly cured up sinus patients without even considering that an allergic condition may be present. The advance in this field, then, has been in diagnosis rather than in therapy.

When it comes to a consideration of the problem of allergy, both the laity and the profession are most eager to hear what the essayist has to say about hyperesthetic rhinitis, asthma and seasonal hay fever. The allergist naturally claims substantial progress in the therapy of

these conditions, but I wonder whether the rhinologist is willing to agree with this claim. I am utterly convinced that the allergist has accomplished little in the specific treatment of hyperesthetic rhinitis, and I am not so certain that his accomplishments in asthma and seasonal hay fever are what they are generally purported to be. I make these statements advisedly because of the enthusiasm manifested by the profession as a whole whenever some now non-specific procedure is advanced.

I am in strict adherence with the view that theoretically specific therapy is the ideal, but I am still waiting to be convinced that the results with specific therapy are superior to our non-specific methods. My experience with ionization therapy—a non-specific procedure—has been more satisfactory than with any other treatment of hyperesthetic rhinitis. My own series of cases as well as those of numerous other workers show from 60 to 70% of patients who have enjoyed prolonged palliation of symptoms. In certain types of asthma, the results are sometimes dramatic. I recently reported the results in two cases of long standing which had resisted every other form of treatment.

In closing, I wish to go on record as urging a closer co-operation between allergist and rhinologist. Too many patients are observed who are placed on so-called injection treatment without adequate rhinologic examination. The presence of local pathologic processes must always be considered as an associated etiologic factor, and in fact, the eradication of local nasal or sinus disease has cured some patients who have spent years exclusively under allergic management.

Dr. O. B. Nugent, Chicago: I would like to ask the essayist to what extent we can depend upon the eosinophiles found in the mucous membrane as a diagnostic factor, and is this misleading? Are there some cases in which the eosinophiles are quite prevalent in which there are no other indications of such a condition being present?

Dr. Leon Unger, Chicago (closing): The eosinophile count of the nasal smear is very accurate. Routine examination of the watery fluid that drips out of the nostrils of allergic individuals will show, as a rule, from 4% to as high as 100%. In such cases there will probably also be a family history of allergy and positive skin tests.

Hansel's new book, which he has been writing for six years, is, I believe, the best book on the subject. Hansel is a nose and throat man in St. Louis. His book pays special attention to allergy of the nose and sinuses.

I want to apologize to Dr. Duntley for not sending him a copy of this paper. Answering Dr. Hollender, I cannot agree with him regarding skin tests when he states that they are of practically no value. It is true that this point of view is shared by many other men in the profession; even an occasional allergist will be found who puts very little faith in skin tests but, by and large, the men who do allergy work have found that when the skin tests are properly done and are correlated clinically they are of immense value in allergy, not only of the eye, nose and throat, but of allergy elsewhere in the body. Experience is necessary to de-

termine the degree of positiveness of a skin test, whether it is done on the back, the arm, or the thigh. As a rule, those done on the back are a little larger than those done on the arm or thigh. Any intradermal method of doing skin tests should be preceded by the scratch tests. If this is not done the intradermal tests are apt to be misleading unless carried out by a competent allergist.

The question of bacterial allergy is very much in dispute. There undoubtedly is such a thing but the process is different. In bacterial allergy the positive reactions come on after a long period of time; in testing with pollens, epidermals and foods the reactions occur within twenty or thirty minutes.

I also disagree with Dr. Hollender on his results of treatment. I do not believe that pure rhinological treatment will give as good results as will be obtained from a combination of rhinological and allergic treatment. It is true that patients very often are greatly improved after their first nasal operation. It is likewise true that many of these have to be operated on again and sometimes as many as four or five and even six times. Each operation is followed by less and less favorable results.

It is a simple thing to make a nasal smear and if eosinophiles are found in moderate or large numbers the patient should be completely skin tested and I am sure that the results of treatment will be much better than if only nasal treatment is followed.

Polyps are, I believe, the result of allergy, not the cause. I was glad to hear that Dr. Hollender was able to cure two cases of asthma with ionization.

Let there be closer cooperation between the men doing rhinologic work and those doing allergy.

## SURGERY OF THE GALL-BLADDER AND BILE DUCTS

CHARLES B. PUESTOW, M. D.,

CHICAGO

In attempting to evaluate the rationale of the various surgical procedures which are commonly performed upon the extrahepatic biliary tract it is important for us to have as thorough a knowledge as possible of the normal physiology of this part of our anatomy, and the changes in physiology which occur in the presence of disease and which follow surgical intervention. Investigative work, carried on both in man and animals, has given us in recent years much valuable information.

We know that in animals possessing a normal gall-bladder there is a sphincter mechanism at the duodenal end of the common bile duct called the sphincter of Oddi, which maintains at all

times enough resistance to the flow of bile into the duodenum to elevate the intraductal pressure. In the dog the intraductal pressure varies from 100 to 200 mm. of bile. During the fasting state this sphincter mechanism completely stops the discharge of bile into the intestine and forces it into the gall-bladder, where it is concentrated and stored. The stimulus produced by food causes some relaxation of this sphincter mechanism, and contraction of the gall-bladder, so that bile is evacuated into the intestinal tract, where it aids digestion. We believe this same type of physiologic response occurs in most animals possessing gall-bladders, as well as in man. In animals which do not have a gall-bladder, however, we find a different type of physiologic response; in this group there is very little sphincter activity at the duodenal end of the common duct, and as a result the intraductal pressure is always very low. In the fasting state what little bile is formed by the liver is not held back entirely in the duct, but slowly dribbles through the orifice into the intestine. We have been unable to determine why nature provided some species of animals with gall-bladders and others without them. It is hard to explain why one of such closely allied species as the pocket-gopher and the striped gopher, or the rat and the mouse, or the horse and the deer, should be provided with a gall-bladder while the other has none. The presence or the absence of a gall-bladder cannot be explained by habits of food, environment, or relationship of species.

In a series of experiments the intraductal pressure in the common bile duct of dogs with normal intact gall-bladders was determined; cholecystectomy was performed at a later date and the pressure again determined. It was found that there was a considerable loss of sphincter tonus, with a very low intraductal pressure resulting. In the series of patients about to be reported the gall-bladder was removed and the common bile duct drained in forty cases. Intraductal pressures within the choledochus were determined in these patients, and in all cases and under all observed conditions the pressure was not sufficiently great to force bile more than 1 cm. above the level of the anterior abdominal wall. We would expect intra abdominal pressure to maintain the level at the abdominal wall. Therefore, it is apparent that, at least in both man and dog, removal of the gall-bladder is fol-



lowed by a loss of sphincter tonus at the duodenal end of the choledochus and a marked reduction in the pressure within the common duct. Removal of the gall-bladder apparently alters our physiology to correspond to that of animals which normally do not have a gall-bladder. I believe this change in physiology is partly responsible for the relief of symptoms in many patients in whom the amount of gall-bladder pathology is minimal. We know that in the presence of disease of the gall-bladder this organ loses its power of concentrating bile, and of contracting. If the sphincter mechanism at the duodenal end of the common duct is active and the gall-bladder is not able to concentrate the bile within it, and thus, by removing water from the bile, keep the pressure below the secretory pressure of the liver, which is about 300 mm. of bile, it is conceivable that distress can be produced by an overly great pressure within the duct. (Considerable has been written about the syndrome spoken of as biliary dyskinesia. It consists of biliary distress and colic in individuals with very little, if any, pathology. One explanation has been a simultaneous contraction of the gall-bladder and of the sphincter of Oddi so that bile cannot pass into the duodenum, and the pressure within the duct is increased, producing pain. If sphincter tonus is lost, or greatly diminished following cholecystectomy so that the intraductal pressure is low at all times, pain produced by increased tension will be eliminated.)

To determine further the anatomic effect of gall-bladder disease and of cholecystectomy upon the common duct the circumference of this structure was measured in a large series of routine autopsies. The average normal circumference, at various ages, was determined and plotted. It was found that where cholecystitis without stones existed the circumference of the common duct was only very slightly greater than that of the normal duct. Where cholecystitis with stones, but without a history of jaundice, existed, the circumference was slightly greater, but not markedly so. However, in those individuals in whom the gall-bladder had been previously removed the duct was greatly dilated.

If cholecystectomy is followed by loss of sphincter tonus and a diminution in intraductal pressure, it would be difficult to explain this dilatation by increased tension within the duct. It is possible that this increase in diameter may re-

sult from a loss of tonus of the duct wall, as well as that of the sphincter following cholecystectomy. The theory has been expressed that a loss of tone of the duodenal sphincter would permit regurgitation of the duodenal contents into the bile duct, and promote an ascending biliary infection. This apparently does not occur, as in no case in which the choledochus was drained was any duodenal content observed to be discharged through the T-tubes. With an open draining tube, minimizing intraductal pressure, one would expect to note such a drainage at this time were it to occur. We know also, from experimental evidence in animals, that the duodenal pressure can be greatly increased and still the contents will not drain out through the choledochus. Further evidence to support the absence of regurgitation of the duodenal contents into the bile ducts following cholecystectomy is the fact that following a barium meal, in a cholecystectomized individual, barium is not seen within the duct. This is probably due to the oblique course of the common duct through muscular coats of the wall of the duodenum.

In summary, therefore, we may say that evidence indicates that in normal individuals with an intact gall-bladder a sphincter mechanism exists at the duodenal end of the common bile duct which maintains a constant and fairly high intraductal pressure. The purpose of this pressure is probably to force bile into the gall-bladder and aid in the absorption of water from it. The ingestion of food causes a partial relaxation of the sphincter and a contraction of the gall-bladder, emptying the bile into the intestine. In the presence of gall-bladder disease, with a gall-bladder unable to do its work, if the sphincter mechanism persists we may have distress from increased intraductal pressure. Following cholecystectomy the sphincter mechanism at the duodenal end of the common duct is greatly diminished, causing a lowered intraductal pressure, a free-flowing of bile into the intestinal tract, and a relief of any disturbance which may result from tension within the duct.

It is on the basis of this introductory evidence that I feel that cholecystectomy is physiologically a sound procedure in the presence of gall-bladder disease. I would like now to summarize a series of two hundred operations for benign biliary tract disease. (See Table.) Of this group forty, or 20%, presented such symptoms as would deem

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it advisable to explore the common duct. Nine, or 22.5%, of this group, had had previous biliary tract surgery. Four patients in this group had stones in the choledochus, with no history of jaundice. The indications for exploring the common duct were as follows: a definite history of jaundice, stones palpable within the common duct, a dilated and thickened common duct, and especially if the cystic duct itself was dilated. Stones were found in 60% of the ducts explored. Although the percentage of ducts opened may seem high, routine autopsy studies have shown that where stones are present in the gall-bladder they can also be found in the common duct in 25% of cases. Therefore, if we do not explore suspicious cases we will leave many stones behind in the common duct to cause subsequent trouble.

Furthermore, I do not believe that merely opening and draining the common duct after exploration appreciably increases the mortality of the operation. In this group of forty patients there were three deaths—a mortality of 7.5%. Although this was a higher rate of mortality than that associated with simple cholecystectomy, this can be expected because of the far greater risks we are dealing with in this type of surgery. One of these patients who died had multiple liver abscesses at the time of operation, and died of a resultant toxemia. A second patient had been jaundiced for nearly two years, and although she recovered from the procedure she gradually declined and died in several weeks of hepatic insufficiency. The third patient had an extensive pancreatitis, and died of a subsequent peritonitis. I believe that the added risk involved in exploring the common duct, where indicated, is less than the risk associated with the leaving of stones in the common duct.

Of the remaining 160 patients surgery was confined to the gall-bladder in seventy-one. In seventy of these the gall-bladder was removed, and in only one instance was it drained. In the other eighty-nine patients the gall-bladder was removed, and some other surgical procedure performed at the same time. This consisted, in most instances, in removal of the appendix, repair of a ventral incisional hernia, and an occasional plastic operation on the duodenum. In this group there were two deaths—a mortality of 1.2%. Thus, for the entire two hundred patients, including the forty in whom choledochos-

tomy was performed, there were five deaths, or a mortality of 2.5%.

The value of any surgical procedure depends, for final analysis, upon the results obtained by it. In this series 88% of those individuals who could be carefully traced after operation obtained a very satisfactory result. They were relieved of their pain and dyspepsia, either entirely or to a high degree, and had no subsequent biliary tract disease. Another 5% were improved, but continued to have some distress suggestive of biliary tract discomfort. All of this group, however, stated that they experienced sufficient improvement to justify their operation.

We learn more from our poor results than we do from satisfactory ones. In this series of cases eight, or 4.4%, were not improved by the surgical procedure carried out. A careful analysis of these cases will help to explain their unimprovement. They consist largely of individuals who have been under observation, for one ailment or another, for many years. In no instance were the histories typical of cholecystic disease. In two individuals—one with an intractable dermatitis, and the second with a severe asthma—a search for foci of infection revealed a pathologic gall-bladder, and cholecystectomy was requested, in the hopes that it might be followed by an improvement in their main complaint. Neither patient was improved.

The remaining patients gave a history of dyspepsia of an indefinite nature. In general they were nervous individuals, with a recognized functional element in their stories. Several had had one or more previous abdominal operations, without relief. In the remainder, radiographic studies revealed a pathologic gall-bladder. All of these patients failed to respond to long periods of medical management, and were finally operated upon in the hope of some improvement; these hopes were not realized.

After carefully analyzing the entire series of patients I am of the opinion that the most important determining factor in the proper therapy of biliary tract disease is an accurate and complete history. When a history is typical of gall-bladder colic and biliary dyspepsia, even though radiographic findings may be negative, I believe cholecystectomy is indicated. On the other hand, where the history is not convincing in the establishment of a diagnosis of biliary tract disease, even though the x-ray may report

a pathologic gall-bladder, cholecystectomy will not necessarily relieve the patient's symptoms. I also believe that in the presence of a diseased gall-bladder, and a patent common-duct, cholecystectomy is the operation of choice. This opinion is based both on the result of physiologic investigation and the end results of clinical surgery.

Included in this group of cases are fourteen instances of acute cholecystitis. There has been much controversy in recent medical literature as to the time of operation upon an acutely inflamed gall-bladder, and a patent common-duct, cholecystitis to acute appendicitis, and suggest immediate surgery; others permit a partial subsidence of the disease, delaying operation for a few days to two or three weeks; still others favor a delay of months, if possible. Twelve of these patients were operated upon in five to ten days after the onset of their attack. In this time they were treated by rest and intravenous glucose, and in most instances their temperature and leukocyte count had subsided to normal. At the time of operation their condition permitted removal of the gall-bladder; all recovered with an average post-operative hospital stay of twelve days and an uneventful convalescence. The one choledochostomy in this series presented at operation an acute suppurative cholecystitis and an extensive pancreatitis, with fat necrosis. This patient recovered, but was in the hospital forty-three days after operation. The fourteenth patient had, besides an acute cholecystitis, intra-hepatic stones blocking off a large portion of the liver, which was studded with abscesses. This patient died of toxemia forty-eight hours after operation.

If a patient is carefully observed, I do not believe that a few days adds greatly to their risk, and it does improve their condition to the extent that in most instances the gall-bladder can be removed.

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#### DISCUSSION

Dr. J. C. T. Rogers, Urbana, Ill.: We all have done cholecystectomies more or less routinely in the process of exploring the biliary passages. There are several valuable practical points in this connection that have been suggested in this paper. The alterations in anatomy and physiology following cholecystectomy have been very nicely and efficiently discussed. Dr. Puestow proposes the thesis that loss of tonus may be responsible for dilatation of the common duct after cholecystectomy. Most of us have believed that "back pressure" has been

TABLE I. SUMMARY OF OPERATIONS AND RESULTS

Benign Biliary Tract Disease	Cholecystectomy	Cholecystectomy plus	Choledochostomy	Cholecystectomy	Total or average	Percentage
Number of patients....	70	89	1	40	200	....
Age onset of symptoms..	36	35	29	39	36	....
Age at operation.....	42	40	35	45	42	....
Previous biliary surgery.	7	2	..	9	18	9
Stones present .....	47	63	1	34	145	72.5
Av. p. o. hosp. days....	14	13	43	17	14	....
Results:						
Satisfactory .....	57	71	1	33	162	88
Fair .....	3	5	..	1	9	5
Poor .....	5	2	..	1	8	4.4
Unknown .....	4	10	..	2	16	....
Hospital deaths .....	1	1	..	3	5	2.5

the chief factor in this change. One of the interesting points that Dr. Puestow mentioned was the probable relationship between intracholedochal pressure and the production of pain. Recently, there has been some noteworthy work done in that line by Bush and McGowan. These men were primarily interested in studying the changing conditions of the common duct following cholecystectomy and choledochostomy. By an ingenious method they were able to represent graphically the approximately 116 mg. of water. It was noteworthy twenty-four hours or more, postoperatively. They found variations in that pressure which amounted to approximately 116 mg. or water. It was noteworthy that the patient's complaint of pain was greatest when the pressure was at its height. In addition to that, they studied and collected valuable data upon the actual effect of certain drugs upon the intraductal pressure and upon the sphincter mechanism at the ampulla. They found that one-sixth grain of morphine caused elevation of pressure within the duct at least twice that of the usual high pressure when the drug was not used. The effect of the morphine was evidently that of causing an initial spasm at the sphincter of Oddi resulting in a rise in pressure and subjective pain. The analgesic effect of the drug later overcame the pain. Other drugs, like allanol and phenobarbital, gave somewhat similar results. Inhalation of amyl nitrite or dissolving 1/150 grain of nitroglycerine under the tongue seemed to decrease the pressure within the ducts and at the same time decrease any subjective signs of pain. I do not know that this is destined to change our attitude toward the use of morphine. We know that morphine will relieve the pain in biliary colic but it was shown by these men that an initial rise in pressure, and an increase in pain preceded the subsequent relief due to the analgesic effect of the drug. This supports Dr. Puestow's contention that increase in intraductal pressure intensifies biliary pain.

The importance in presenting this group of cases is quite obvious. The fact that 92% were relieved and that the surgical procedure was warranted, is significant, but as the essayist has mentioned, the 5% poor results is the point to which our careful attention should



be directed. We must all realize that cholecystectomy will relieve almost without exception the patient with gallstones and a history of colic. But the nervous patient with chronic dyspepsia, and with a questionable cholecystogram is the one that gives us no more than a 50% chance of improvement. The poorly functioning gallbladder by x-ray without stones and without colic is the one that is the bugbear of the surgeon. The poorly functioning gallbladder with colic, to which Dr. Puestow refers, is the one which responds only fairly well to gallbladder surgery.

The manner of handling the acute gallbladder comes up. Looking over the literature, I find that there is no more than one per cent. of acute cholecystitis cases, if allowed to rest, which ever ruptures and causes general peritonitis. It is the consensus of opinion that the organism builds up its resistance to acute infection. Exploration is most effective, when the peak is reached and there is a subsiding of the condition. I am impressed with this paper because it correlates practical experience with some of the newer experimental data in this field. It is most important for us to consider gallbladder surgery in terms of physiology and pathology if we are to hope for improved clinical results.

Dr. C. P. White, Kewanee: I think most of us have had the experience of removing these gallbladders with questionable pathology and clinical symptoms and had complete relief of those symptoms in the patient for a period of one or two years, and then the patient returned with a recurrence of the symptoms. Dr. Puestow says he has left this tube in the common duct for a period of six months, and that relief of the symptoms is due to the paralyzing or at least reflex action upon the sphincter muscle at the duodenal end. I wonder if he has any way of knowing or if there is any reason to believe that there is a final return of spasm in the duodenum that might cause this pain, or how does he account for the return of pain in these patients later on in life.

### The RECRUDESCENCE OF MALARIA

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Malaria has been increasing in the United States since 1932. The increase in Illinois has been proportionate to that in the Southern States. Our state records show that it has caused 574 deaths during the last ten years, the lowest number per year, during this period, being 39 in 1932, and the highest, 71 in 1935. The number recorded for 1935 is the highest since 1921. It causes about half as many deaths each year as typhoid fever.

Malaria has always been a world problem—so serious in many countries that it has been called the scourge of mankind. Its history dates

from antiquity. The decadence of the early Grecian civilization has been ascribed to its ravages.<sup>1</sup> It has always been a problem in Italy and during the last year has been the greatest danger to the Italian armies in Ethiopia. In 1923 an epidemic of malaria caused great distress and many deaths in southern Russia. Serious epidemics have recently appeared in the vicinity of the Straits Settlements and in Ceylon. In spite of all the efforts which have been made to eradicate this disease in the Panama Canal Zone, it is still there and is still a public health problem.<sup>2</sup> Hanson, while making the chairman's address at the National Malaria Committee's Conference on Malaria in 1934, said: "Eradication of malaria is not appreciably closer at hand than it was when the committee was formed (1916), even though the roster of charter members embraced the leaders in tropical medicine in the first quarter of the Twentieth Century. We are not so optimistic of accomplishing eradications as we may have been 10, 15 or 20 years ago. The hope now is to accomplish a fair degree of control."<sup>3</sup>

Until recently the death rate from malaria has been gradually falling in the United States for many years. In fourteen of our southern states it reached an all-time low of 6.8 per 100,000 in 1932.<sup>4</sup> Then quite suddenly it jumped to 11.7 in 1933, and in 1934 reached a higher peak than had been seen in twenty years. According to estimates more than 5,000,000 cases occurred in this group of southern states in 1934, with a probable cost of one-half billion dollars.<sup>5</sup>

In many of our northern states, where the disease was once prevalent, it has almost disappeared, and there is a tendency for physicians and others to think that it is no longer a menace and that we can dismiss it from our minds. This attitude is common in some parts of Illinois, but investigation shows that there is little reason for feeling this way about it. The average number of deaths per year for the last ten years is 57.4. There were 62 deaths in 1933, 60 in 1934, and 71 in 1935. During the five year period ending in 1930, malaria caused 281 deaths in this state, and 293 during the last five years. Deaths were reported from 20 counties in 1932, 24 in 1934, and 32 in 1935. Since 1930 deaths have been reported from such northern and central Illinois cities as Chicago, Rockford, Evanston, LaSalle, Aurora, Kewanee, Moline, Danville,

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Peoria, Quincy, Springfield, and Decatur. Thirteen of the counties reporting deaths in 1935 were as far, or farther, north than Sangamon, and 26 deaths, out of the states total of 71, were reported from these counties, 11 being from Cook. In 1934 only six counties from this section reported deaths from malaria. Infection in transients and narcotic addicts may account for some of these deaths in the northern part of the state. However, the fact that this number of deaths occurs in this region shows that carriers are there and that local epidemics may be expected anywhere. Shaughnessy has shown that the use of malaria in the treatment of paresis may become a public health hazard.<sup>6</sup>

The morbidity rates for the various states are notoriously unreliable as malaria is seldom reported.<sup>7</sup> In 1931, 561 cases were reported in Illinois—the largest number for any one year since 1926. Sixty-one deaths occurred in this state that year. It is believed that we have about 300 cases for each recorded death.<sup>8</sup> At this rate we had about 18,000 cases per year in 1931, 1933 and 1934, and with 71 deaths in 1935, we probably had a minimum of 21,300 cases last year. In many parts of the South the falciparum parasite is considered responsible for most of the deaths.<sup>9</sup> This may be true in southern Illinois. However, the tertian parasite is responsible for most of our infections in this state and, while it causes some deaths, the rate from this parasite is low in comparison to falciparum infections. Since the tertian parasite with its low rate predominates in this state, it is possible that we may have over 400 cases to each death. Any disease which causes from 18,000 to 28,000 cases of illness per year in one state deserves serious consideration.

The *Anopheles quadrimaculatus* mosquito is the chief vector of malaria in this part of the world. It is found throughout Illinois and as far north as central Minnesota, so all of this region is potentially malarious. Other anopheline vectors are also found in this region and in Canada. In Europe and Asia some of the regions in which malaria is most highly endemic are considerably north of the summer isotherm of 70° F. In this country this corresponds to the territory around Lake Superior. The death rate from malaria in Illinois in the middle of the 19th century was enormous.<sup>10</sup> It caused 1,146 deaths in 1860 with a rate of 66.9. In 1880,

1,114 deaths were reported, the rate being 36.1. This is about the present rate in Arkansas, so it is obvious that we still have a very heavily infected area quite close to us. In 1900 the number of deaths dropped to 497, which made the rate 10.3. This is the present rate in our southern 12 counties. From 1917 to date it has ranged from 1.70 (in 1917) to an all-time low of 0.50 in 1932. Our all-time low in Illinois appeared in 1932 as it did in the southern states. The mortality rate for this disease follows rather definite cycles, high peaks appearing about every ten years with minor elevations appearing between these high peaks. The last great epidemic in Illinois occurred in 1872.

The mortality rate in Illinois during the last five years has ranged from 0.5 in 1932 to 0.89 in 1935. The rate in the north half of the state has been low for many years, and as most of the population is concentrated in that part of the state, this makes the state rate look very favorable. Large cities have little malaria. The rate for Illinois, excluding Chicago, is 1.36 for 1935. Adding Chicago's population reduces this to 0.89 despite the fact that malaria caused 11 deaths in that city last year. The picture in the southern part of the state is quite different. In 1934 Alexander County had a rate of 31.0; Johnson, 29.0; Union, 20.0; Massac, 7.0. In 1935 the rates were as follows: Alexander, 13.30; Johnson, 29.40; Union, 5.02; and Massac, 42.17. Twelve counties in this malaria belt had an average rate of 10.3 in 1935. The same group had about the same rate for the years 1922, 1923 and 1924. The rate for the lower 28 counties in 1935 was 5.5. The northern boundary of this group of counties crosses the State from east to west, just south of Alton. The 1935 rate (10.3) for the lower 12 counties is higher than the 1933 state rates in Virginia (0.4), North Carolina (1.2), Kentucky (2.9), Oklahoma (4.7), Missouri (5.5), Texas (6.2), Alabama (9.8), and Tennessee (10.1), and is exceeded only by Georgia (12.3), South Carolina (13.2), Louisiana (20.2), Florida (24.0), Mississippi (35.5), and Arkansas (48.8). The 1933 rates quoted for these states are much higher than usual because of the sudden increase from the 1932 all-time low.<sup>11</sup> The 1932 average for these states was 6.8, which is not much higher than the 1935 (5.5) for our southern 28 Illinois counties, and the 1933 rate of 11.7

for these states is not much above the 1935 rate (10.3) of our southern 12 counties. The Massac County rate of 42.17 and Gallatin's rate of 39.36 for 1935 puts these counties up with the worst of them.

The fact that a county has no malarial deaths does not mean that its case rate is low. Prior to 1935 we have had no deaths in Lawrence County for several years, but we have had many cases of malaria. The school records in Lawrenceville show that about 100 students were absent because of malaria in 1934, while none were absent because of typhoid.

The sudden increase in malaria in our southern states which started in 1932 and 1933 has been accompanied by similar increases in malarious foci in the north and by the reappearance of the disease in many places from which it has long been absent. A small epidemic appeared in Paw Paw, Michigan, in 1934.<sup>12</sup> A few residents in this town were carriers, having been infected in Central America. The pickers in the neighboring Michigan fruit belt come from all parts of the country, and some have malaria. A survey by the health authorities turned up 18 active cases of malaria, 48 breeding places for mosquitoes, and *Anopheles quadrimaculatus* mosquitoes. Another epidemic was reported from Aurora, Ohio, thirty miles southeast of Cleveland, in 1934.<sup>13</sup> Thirty-seven cases were discovered in this town of 1,000 inhabitants. The disease in this instance was probably introduced into the town by a citizen of Florida who was ill there in May. In 1933 an epidemic was reported from Peoria, Illinois, during which 26 patients were admitted to one hospital. Five of these patients died. Twenty-six cases of malaria were admitted to the same hospital in 1930, and 13 in 1931, so there must be a number of carriers in the vicinity of Peoria.<sup>14</sup> Richardson,<sup>15</sup> while discussing the Peoria epidemic, calls attention to other epidemics, within recent years, in Springfield and Decatur and says that the Decatur people decided that the epidemic there was imported by automobile. He says further, "The Peoria outbreak would not be exactly unique in Central Illinois. We have them every once in a while." Epidemics caused by the common use of a hypodermic syringe by narcotic addicts have been reported from Egypt, and in this country from Chicago, New York, New Orleans, Omaha and the Leavenworth Peniten-

tiary. In New York City 41 such cases of malaria were treated from Sept. 29, 1933, to Jan. 30, 1934. Sixteen of these patients died. One death was due to infection by the quartan parasite. The rest were caused by falciparum infections.<sup>16</sup>

Before considering the possible causes of the recent increase in malaria in Illinois, it may be wise to briefly consider the history of the disease in this part of the country and to examine the causes for its long decline. This is logical since a reversal of the economic and other factors which caused it to diminish may very easily permit it to come back again. The pioneers in Southern Illinois came from the South and were heavily infected when they entered this territory. Conditions here were ideal for perpetuating the disease. The pioneers in the northern part of the State brought some infection with them but it was mild in comparison to that farther south. In all parts of the state the settlers depended on the waterways for power and transportation. They built their trading posts, mills and forts along the streams. Newcomers swapped diseases with the permanent residents. Farmers, trappers and traders from miles about frequented these posts to barter and to visit and contributed to the general pool of infection. Later shifts in the population caused by canals, railroads, wars and westward migration caused epidemics. Mosquitoes were everywhere, the people were poor and improperly nourished, clothing was insufficient, houses were poorly constructed, quinine was expensive, and the population was still on the move. The Civil War exposed thousands of northern troops to infection in the South, and it was a number of years before there was a marked decrease in the death rate.<sup>17</sup>

Europe was rapidly becoming industrialized. Europeans neglected agriculture, buying the needed farm products from us. The demand was enormous. As a result our forests were cleared, our low lands ditched, the great central prairies of the state drained and farms appeared in their places. The newly built railroads carried our farm products to eastern ports. Money rolled in as a result of these activities. The population became fixed. Better houses were built. There was money for better food and clothing and for quinine. Farm animals were introduced, making it possible for mosquitoes to get blood meals



without having to depend entirely on man. Citizens of each locality developed some immunity to its particular malarial parasites, as soon as population shifts stopped. The harder northern winters gave the people more of a chance to overcome the infection.<sup>18</sup>

The consensus of opinion among students of malaria is that those changes, consequent to the destruction of mosquito breeding places while developing farms, and the subsequent improvement in the economic status resulting from the sale of products of these farms, had more to do with the decrease in malaria mortality and morbidity than anything else. The economic improvement made it difficult for malaria to flourish, and it gradually declined. The death rate from tuberculosis has shown a similar trend. In many parts of the North malaria has disappeared without any particular effort on the part of the inhabitants, and in a large part of the country no direct effort at malaria control is being made today. This is one of the causes for uneasiness.

Malara has always been a rural problem and the depression, with its poverty, has had much to do with its recrudescence. Economic conditions have changed. The farm income has dropped from 12 billion in 1929 to  $5\frac{1}{2}$  billion in 1932. It is now around 8 billion. The demand for our agricultural products has declined, due to loss of European buying power and to competition with Canada, Australia and South America. The destruction of our forests and the drainage of our swamps, lakes and prairies, allows flood waters to enter our rivers too rapidly, causing costly floods, which damage farms, drown livestock and impoverish the farmers in the valleys. Mosquito breeding places are multiplying. Low land, when no longer profitable, is abandoned and returns to a semi-wild state. Millions of acres are going out of production and will not be used again for years, as this present economic upset in our farming communities is no temporary affair. Illinois has many river valleys where these conditions prevail.

While many farms have gone out of cultivation almost every available house in the country is now occupied by some family (often undernourished) which has returned to the land while attempting to weather the depression. Most of

these houses are in poor condition. Many city people have purchased small tracts of land along our improved roads, upon which homes have been built, thus increasing the rural population. Paved roads and automobiles have the population on the move. Laborers can now follow the crops from south to north. A cotton picking machine has been invented which will release 75% of the labor where it is used. Laboring people in the cotton country live in some of the most heavily infected regions in the South and many will be carriers wherever they go. Inhabitants in our malarious regions in such times as these are undernourished and are financially unable to buy needed medicine and to properly screen their houses.

Dams are being built in our rivers for purposes of flood control or for furnishing power. Unless properly cared for such artificial lakes always cause an increase in malaria. The shores of many lakes are lined with cottages within easy flying range of anopheles mosquitoes. Dance halls, amusement parks, swimming pools, wayside eating places and tourist camps are often located near streams or lakes. Athletic contests such as soft ball games are often played late in the evenings under flood lights, attracting crowds of spectators and exposing many to attacks by mosquitoes.

The disease now as always follows the rivers, and Illinois is bordered by large rivers to a great extent, and is penetrated by large tributary river systems, in all of which flood control is a problem. On the map one notes that the heavily infected countries are on the Wabash, Ohio, Mississippi, Kaskaskia, Illinois and other rivers. The counties on the water sheds show the lowest rates and those along the rivers the highest. Since 1905 the Eastern Illinois oil field has furnished an automatic oiling system for the Embarrass and Wabash rivers. The waste oil usually kept a good film on these streams and the creeks which flowed into them. After floods the receding waters left an oil supply on pools which discouraged mosquito breeding and killed vegetation along the banks. Four years ago the oil companies were ordered to destroy all waste oil to prevent stream pollution. Our streams are now clean but we have more mosquitoes. We have all noticed a great increase in malaria and one of our older physicians tells me that he has



seen more cases in the last four years than he saw in the two preceding decades.

Since 1922 mosquito abatement projects have been started around Chicago and its suburbs, and in several southern Illinois towns under the direction of the State Department of Public Health. Where malaria is present these projects have materially reduced its incidence, and the mortality rate would undoubtedly be higher if this work had not been done. It is not difficult to control mosquito breeding in the vicinity of cities. All territory within a mile of the city limits should be included in the project. Such work can be done at a cost of \$500.00 to \$1000.00 per square mile.<sup>19</sup> With WPA labor available in all communities, this work should be done without any additional cost whatever. Methods of control which are feasible for the concentrated populations of towns and cities are, in ordinary times, economically impossible in rural communities, where proper screening is the easiest, cheapest, and most reliable of all control methods. However, any other practical methods of control which can be used, should be added to the screening program. Intensive state-wide treatment is now being tried in two southern states, using atabrine and plasmochin.<sup>20</sup> The results are not yet available. In a recent survey made in Arkansas to determine the incidence in school children, the blood film malaria index varied from 1.53 to 17.47 per hundred, the average rate for the counties examined being 8.15. In the Arkansas penal institutions 5.9% of the inmates were found to be infected. Treatment of these prisoners with atabrine and plasmochin was very effective, the relapse rate being very low.<sup>21</sup>

The carrier deserves special attention. If he can be eliminated malaria can be eradicated. But the carrier is often hard to find for he may look like the healthiest citizen in the community. Usually, but not always, he will tell you that he has had "chills" at some time during the preceding two or three years. In December, 1930, while treating a baby for melena neonatorum, I gave it 30 c.c. of its father's blood. The father appeared to be in excellent health and had not been ill for years. The child's bleeding stopped immediately but in about eighteen days it had quartan malaria. The father proved to be the source of this infection. I have seen the same thing follow a transfusion in which the donor

was apparently healthy. Many of these carriers have established an equilibrium with their parasites and suffer no visible ill effects from the infection. Those who have been unable to do this are often undernourished, anemic, tire easily, have vague neuralgic pains and may have chills after being exposed to cold, when very tired, or after operations. In a country where malaria is rare these patients are often treated for other diseases. On the other hand, in malarious districts all kinds of "chills" are likely to be called malaria. As an example, I saw a boy in 1931 who had been treated for malaria for 14 weeks because he was having chills every few days. He had rat-bite fever. The chills seen with an obstruction of the common bile duct are also very confusing.

#### CONCLUSIONS

1. Foci of malaria are present in all parts of Illinois.
2. The disease is increasing and the present combination of circumstances affords an excellent chance for it to spread from its old strongholds into new territory.
3. The possibility of malaria must be considered in all "obscure fevers".
4. It causes only half as many deaths as typhoid, but probably is responsible for twenty-five times as many cases.

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### DISCUSSION

Dr. Leroy H. Sloan, Chicago: In his very excellent paper Dr. Kirkwood has called attention to an old problem in medicine. In spite of a vast amount of clinical efforts and the expenditure of enormous amounts of money, malaria still remains a medical problem. In the southern part of Illinois and the region roundabout it is, I believe, largely a problem of prevention and active treatment, while for us in Chicago the problem is more one of diagnosis. We in the northern part of the state forget malaria. We are unable to think in terms of malaria. Our students and interns rarely see an active case of malaria infection. However, those interns in our Chicago hospitals who have been born in the south see in every patient with a fever, chill, headache, stomach ache, nausea and vomiting a potential case of malaria while our interns born away from the southern states think largely in terms of endocarditis and sepsis.

You may be interested in some statistical reports from various Chicago hospitals. One hospital has admitted 150,000 patients since its opening. One patient in 6000 had malaria. Another hospital with which I am familiar had 25 patients in 10,000 admissions during the period of four years. Another hospital had reported 15 patients with established malaria in the last five years. However, at the Cook County Hospital there have been a large number of malarial patients in the last two or three years.

Of 80 cases in Chicago in private institutions the source of the infection was distributed all over the world—Belgian Congo, Mexico, Greece, Wisconsin, Arkansas, Alabama, Massachusetts, Louisiana, Michigan, Missouri, southern Illinois, Texas, Florida and the like. Malaria has been associated in these private patients with diabetes, tuberculosis, renal infections and syphilis. One patient is recorded who contracted malaria during transfusion from his father. In the Cook County Hospital the malaria patients in the last two or three years have been in fairly good numbers "line shooters," that is, addicts given to using each other's needles for intravenous injection of the particular narcotic. In our own ward in the last seven months 12 patients have been diagnosed as having malaria with one death; 9 of these patients were line shooters. By preference these addicts were heroin

users. It is reported that in our addicts many are mixed infections. We have learned that a white blood count of even 25,000, 20,000 or as in a recent case 15,000 does not rule out the presence of an active malaria. It is very probable that in patients with undetermined fever we might well again use the therapeutic test of quinine or one of the more recent remedies such as atobrin or plasmochin to rule out the presence of malarial infection. It is very probable that we should examine more carefully for enlargement of the spleen and surely in all patients with a leukopenia should give thought to the possibility of malarial infection. We would do well to bear in mind many of the fine points which Dr. Kirkwood brought out in his very excellent paper.

Dr. Kirkwood: (Closing Remarks) Malaria is causing about the same number of deaths as diphtheria and typhoid in the 28 southern Illinois counties, although only responsible for about half as many deaths as the latter disease in the entire state. However, the case rate from malaria is far higher than either of these diseases and each patient is ill from one to several weeks. This is the most serious part of the problem.

I would like to thank Dr. Sloan for his excellent discussion, and to express my appreciation for assistance from Dr. McShane of the State Department of Public Health, and Drs. Dauer and Faust of Tulane University, in assembling data for this paper.

### VARIOUS ACTIVITIES OF THE BEATING HEART

EMMET KEATING, M. D.

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The human heart is a tough customer. Protect children from mild chronic infections and heart disease will lose its high place of morbidity and mortality. In its output of blood there is an average of three to five liters per minute for the resting heart and as much as twenty liters per minute to meet the demands of strenuous exercise. This wide range marks the amount of cardiac reserve. There is in the normal heart a nice adjustment of pressure between the auricles and ventricles; for the auricles not in excess of five m.m. of mercury, and for the ventricles, one hundred twenty to two hundred m.m. of mercury. These amounts of pressure are sufficient to meet the physiological needs of the normal heart.

It is not difficult to imagine what happens to the economy of the heart when the mitral valve is affected by disease. Here is an all sufficient reason to give parents, as to why children should rest in bed when there is elevation of temperature. All physicians know the impor-



tance of rest in bed for the child when fever is present. Unfortunately, all parents do not know. The physician is not consulted and the damage is done.

The old adage, "Digitalis and rest, the only treatment for heart disease," held sway for so many, many years that laymen were converted to that belief with disastrous results for the laymen and serious reflection on the intelligence of physicians. The treatment of heart disease, once a restricted endeavor, with the stethoscope as the faulty and chief reliance, now invites the entire field of medicine.

The beating heart is a most interesting laboratory in the realms of physics. In the performance of its duty of supplying blood to itself and to all the tissues of the body, there is offered for contemplation the working of various physical laws.

Some of these laws have been common knowledge for a long time. They were discovered by men who had an absorbing curiosity to learn the reason for things that happen. Those men witnessed certain events in nature that are constant in occurrence—the falling apple, the swinging pendulum and the dancing lid of the steaming tea kettle. In their minds was ever present the question, Why? These and other phenomena of nature open to the inspection of all, but the reasons for their occurrence appealing only to the few, arrested their attention. The discovery of reasons by the few are the milestones of progress along the trail of the centuries. This burden has never been laid down. In every branch of science the same type of pioneers continue to erect milestones of progress.

Some of the physical laws which play so important a part in the ability of the heart to perform its work are simple in character and are readily understood by immature and untrained minds. This is fortunate in that it makes it possible for the physician to illustrate in language that the patient can understand, what the heart does, how its owner can ease its burdens, and keep it worthy of the one-time slogan displayed at the show booth of a well-known popular priced automobile. "Gets you there, gets you back." Other physical laws presented by the beating heart are complicated and require the possession of a knowledge of some one or more of other sciences in order to fully comprehend their significance.

The contractions of the normal heart are rhythmic in character. With the opening of the mitral and tricuspid valves, the laws of gravity come into play and have their part in the filling of the ventricles. The contracting auricles increase the pressure within their chambers and give sufficient momentum to carry the blood to the ventricles in ample time to maintain the physiological rhythm necessary to the proper distribution of the blood. The rising volume of blood in the ventricles invites the function of another physical law and the valve leaflets are floated to the position where they act as barriers to prevent the return to the auricles of the ventricular contents. With the increased pressure resulting from the contracting ventricles, the thin and delicate valve leaflets would, like sails before the wind, be bellied into the auricular cavities and their purpose as barriers to the return of the blood from the ventricles be defeated. To prevent this, the chordae tendinae and the papillary muscles, the guy ropes of the heart, now come into action and the laws of stress and strain assume a role of major importance.

Peripheral changes in the circulation bring into activity laws having to do with hydraulics, those laws of hydraulics relating to the passage of fluids through conduits.

The fundamentals of the foregoing laws are quite generally understood. Perhaps a common knowledge of these simple laws makes them appear to the physician unworthy of serious consideration. It might seem a childish waste of time for the physician to devote study of their application to the treatment of the damaged heart. On the contrary, knowledge of the foregoing laws is worthy of serious consideration, and study of their application is time well and profitably spent in the successful treatment of heart disease.

Frequently, patients present themselves with symptoms in keeping with damaged hearts. Careful examination reveals heart anatomically sound. These hearts are temporarily suffering from the effects of pathological conditions in one or more areas of the body other than the heart. Osler said, to know syphilis is to know medicine. Of even greater importance, it seems to me, is to know the heart if you would know medicine, but know something of all there is to know of medicine if you would know the heart. In Osler's day syphilis went unrecognized. In our



day syphilis goes unrecognized. Ricord was ridiculed and accused of seeing syphilis everywhere. Belfield maintained that everybody had syphilis. In obscure cases all physicians suspect syphilis. Their suspicions are banished by negative laboratory findings. This is unfortunate.

The two most important parts of a heart examination are the story told by the patient and the physical examination made without the aid of any instrument or machine. One of the most deplorable and misleading statements in case reports is "Past history essentially negative," or in describing the physical examination, "Head and neck essentially negative." It is a fine out for either a slovenly made examination or it might be interpreted as an intent to deceive.

Mechanical aids are of some value to those who have eyes but see not and powers of observation that function indifferently. Mechanical aids are often of decided value to those who know how to take histories, who know the appearance and feel of the normal and who understand the effect or lack of effect of factors near or remote. For permanent records, mechanical aids are invaluable to the progress of clinical medicine.

The first instrument of precision intended for the purpose of direct study of the heart is the stethoscope, invented by Laennec in 1819, and based upon the laws of sound conduction. Since that time the stethoscope has occupied a most prominent place as a diagnostic aid. It has a definite value as a means of discovering valvular disease, but is not of much use as an aid in interpreting muscle status or as a guide to treatment.

McKenzie rewrote the History of Heart Disease and by means of the polygraph made visual records of circulatory events. Einthoven invented the electrocardiograph, which replaced the polygraph. The Roentgen ray made possible accurate knowledge as to the location, size and continuity of the heart; accurate knowledge as to aneurisms and other tumors that affect the heart. None of these important facts can be demonstrated satisfactorily by means of palpation, percussion or auscultation.

Within recent years attention has been given to a subject long neglected—that is, study of the peripheral circulation. The plethysmograph gives us visual evidence of the status of the peripheral circulation, enhances our interest in the study of

this condition and the effect of peripheral changes on the integrity of the heart.

The physiologists have made studies correlating different heart activities and charted their findings. This chart, taken from Pardee's book on "Clinical Aspects of the Electrocardiogram," is interesting because it vividly portrays what every doctor knows, in many instances but vaguely. It portrays things to which few doctors have given careful study, the relation of various activities of the beating heart to one another.

In this chart is recorded time relations of auricular contraction and pressure within the auricles and ventricles, and the remoteness of the first heart sound to auricular contraction. In the contraction of the ventricles we see the closer relation of contraction, pressure and first sound.

We will first establish the geography of the various lines. The vertical lines are constant in direction, fifteen in number, and equally spaced.

We will now consider the geography of the various lines traversing the field.

The tracing marked "E" begins to rise at vertical line No. 1, describes a gentle curve and returns to the original level. Again it rises to a sharp peak, then descends to a point below the original level, rises for a short distance, when it is extended to the right, first with a slight downward curve, then curving upward and finally returning to the original level from which it started.

The second tracing, "S," maintains the same level until it has passed vertical line No. 5. Then it travels up and down in a series of quick deflections until it approaches line No. 8, when the movement becomes slower. Crossing line No. 9 there is a return to the original level, until it approaches line No. 14, when another series of up-and-down deflections are inscribed.

The third tracing marked "A" proceeds at the original level until it reaches line No. 2, where it describes an upward curve, returning to the original level at vertical line No. 5. It then rises and describes a smaller arch with a shorter base, proceeding on the original level until vertical line No. 14 is reached, when it makes a shorter drop.

The fourth tracing marked "V" makes a somewhat undulatory progress until it reaches vertical line No. 5, when it makes a sharp and sudden rise, which terminates in a graceful curve, the

highest point of which is at vertical line No. 10. It then begins the descent, reaching the original level at vertical line No. 15.

We will now establish the identity of the various lines. The vertical lines are divisions of time, each space representing 0.04 second. There are fourteen spaces, totaling 0.56 second, the average time of the heart cycle.

Tracing "I" is taken from Lead II of an electrocardiogram.

Tracing "S" is a phonocardiogram showing the relation of the first and second heart sounds.

Tracing "A" represents the pressure within the right auricle.

Tracing "V" represents the pressure within the left ventricle.

The contraction of the auricles begins at vertical line No. 1, reaches its peak 0.04 second later, returns to the original level about 0.10 second after its origin. It then proceeds to line No. 4, which marks the end of auricular contraction and is known as the PR interval.

The line marked "A" represents pressure within the right auricle. You will observe that it does not begin to rise until at least 0.06 of a second after the beginning of auricular contraction. It reaches its peak at the time the P wave has returned to the original level.

The explanation of the difference of muscular activity and rise of pressure is that the excitation of the auricular mass is not instantaneous but begins in a few fibres and gradually spreads throughout both auricles. The return of P wave to the original level is not evidence of the completion of auricular contraction as proved by the line representing auricular pressure. Some fibres have relaxed and some are still contracting. At vertical line No. 4, representing an elapsed time of 0.12 of a second from the beginning of the contraction of the auricles, we have the beginning of ventricular contraction. In this electrocardiogram Q is not inscribed. R is inscribed and S is inscribed. Then follows a slight dip preceding the inscription of T. You will note that the ventricular contraction began at the fourth vertical line while the ventricular pressure did not begin until 0.16 of a second of time had elapsed, the fifth vertical line measuring that division of time. The ventricular pressure rises abruptly and reaches its highest point at the tenth vertical line or 0.36 of a second after the

beginning of the contraction of the auricles. It then begins its descent at the time the peak of the T wave is inscribed. The relaxing of pressure is coincident with the final contractural spurt of the ventricles represented by the T wave.

We will now note the relation of the heart sounds to muscle contraction and pressure. The first upward deflection of the phonocardiogram, representing the beginning of the first sound, takes place 0.06 of a second after the beginning of the contraction of the ventricles and 0.18 of a second after the beginning contraction of the auricles. It reaches its maximum height 0.11 of a second after the beginning of ventricular contraction. The first sound is completed 0.20 of a second after the beginning of ventricular contraction. We now have a silent period during the time that ventricular pressure is reaching its highest point and at the point where the relaxation of pressure is nearly completed. Just before this level reaches the fourteenth line, or 0.50 of a second after the beginning of auricular contraction, the second heart sound is inscribed, and is completed at the time when ventricular pressure has entirely disappeared.

#### SUMMARY

1. All children having from half to one degree of fever should remain in bed until fever subsides.
2. If children develop an endocarditis a minimum of four months is not too long for rest in bed.
3. There are many patients suffering from Symptoms of heart disease in whose treatment digitalis has no place.
4. Because of its spectacular value when indicated digitalis as a remedy for heart disease has been greatly abused.
5. Thinking of the heart as a pump is not sufficient for detailed study and proper treatment.
6. Peripheral changes deserve a great deal more of the physician's attention.
7. The chief use of laboratories is to teach physicians what they may expect from clinical findings and to preserve visual records.
8. All patients in whom heart disease is suspected should have a fluoroscopic study of chest, pictures, and an electrocardiogram. If the patients cannot afford these laboratory measures,



it does not mean that fairly successful treatment is impossible.

9. All physicians should learn to read x-ray pictures and electrocardiograms. It is not sufficient to depend upon the judgment of the relatively few physicians who are expert in these two lines of endeavor.

#### DISCUSSION

Dr. Warren Pearce, Quincy: Dr. Keating has called our attention to some of the mechanical features of the beating heart which it is well to consider occasionally. A knowledge of these mechanical features is helpful in considering the abnormal activities of the heart.

In this presentation the picture of the study of heart disease has been present in its proper perspective. The history obtained from the patient is of greatest value. Next in importance is the physical examination, and of secondary importance is the use of such mechanical aids as the electrocardiograph. The importance of the electrocardiograph is fully realized even though it is placed third among features of importance in the study of heart disease. In a study of the diseased heart the information we most desire is the reserve capacity of the heart and the patient's story, along with response to exercise at the time of examination, tells us more about the cardiac reserve than any feature of the examination.

Dr. Keating referred briefly to digitalis. All of us, I am sure, have seen patients who had received digitalis for weeks or months, with no particular attention to dosage, often without any medical supervision. We should all constantly keep in mind the fact that digitalis is a drug with definite indications and that when indicated it should be used until the digitalis effect is obtained and that then the drug should be stopped with the exception of a maintenance dose. Its use, prophylactically, in surgery is not warranted. Dr. Paul White has outlined the indications for the use of digitalis as follows: 1. Congestive heart failure; 2. certain cases of auricular fibrillation and flutter; 3. as a therapeutic test in cases of suspected congestive heart failure.

Dr. Keating's paper, especially that portion relating to the mechanical features of the beating heart, is unusual, taking us away from the usual beaten path and, to me, has proven quite interesting.

Dr. Keating (closing remarks): I chose to talk about these mechanical factors, not because you are not all familiar with them, but because I wanted to bring to your attention the ease with which you can tell your patients and give them reasons for what you want them to do in the matter of rest. Rest does not mean just staying in bed. It means a great deal more than that. It means rest of the body and it means rest of the mind. It means the education of the patient mentally and physically.

People who are undergoing mental troubles often develop coronary occlusion, just as it has been noted that people who have had great financial losses in the past have developed carcinomas—General Grant and

Camp, the great shipbuilder of 40 years ago, who suffered financial losses.

I want to say that if you will just think these things over you can get your patients converted to your belief, and if you do not do some of these things you will be disappointed in your results and your patients will not go on.

Because of its spectacular results in those cases in which it is indicated, I do not think there are enough doctors who appreciate the amount of trouble they bring upon their patients and themselves by giving digitalis. Long ago the medical profession decided digitalis was good for everything that was the matter with the heart, especially in the treatment of pneumonia. There are a large number of doctors who would not think of treating a pneumonia patient without the use of digitalis. They would think they were indulging in malpractice, when, as a matter of fact, there are many pneumonia patients who will get along much better without digitalis.

In the picture of pneumonia, when your patient is suffering from lack of compensation in the heart, you will find more value in caffeine than you will in digitalis. In fact, you will find very exceptional value in caffeine, while in digitalis you will not find very much.

#### THE COMPARATIVE VALUE OF VARIOUS METHODS IN THE ROENTGENOLOGIC EXAMINATION OF THE COLON

CESARE GIANTURGO, M. D., M. S.

URBANA, ILLINOIS

The roentgenologic diagnosis of colonic diseases offers a number of technical problems. The purpose of this paper is to study the various methods of examination and to attempt to establish the comparative value of each.

Before the advent of contrast media, air was injected into the colon for the purpose of radiological diagnosis. But when Cannon and Riedel introduced the use of opaque substances in the form of salts of bismuth or barium the use of air was rapidly abandoned.

For years the colon was examined by following the opaque meal through the gastrointestinal tract: with this technique many observations were required and the opaque medium often reached the colon in a condition of dehydration that made it impossible to obtain a good moulding of the intestinal walls. Furthermore, there was danger that the hardened contrast medium would transform an incomplete colonic obstruction into a complete one. These objections were





Fig. 1. Polypoid mass in lower sigmoid. A. (Upper left) Barium enema; roentgenogram taken with ordinary technique. B. (Upper right) Overexposed roent-

genogram. C. (Lower right) Double contrast method. D. (Lower right) Semi-transparent medium.

eliminated by the use of the opaque enema. This method is generally employed today.

In spite of its many advantages not even the opaque enema satisfies all diagnostic requirements. In 1923 Fisher pointed out that by using the opaque enema one could easily miss those small, pedunculated polypoid lesions which do not deform the contours of the intestine. He suggested that these lesions could be demonstrated by insufflating the colon with air after evacuation of the contrast enema (double contrast technique). In the meantime Forssell, Berg and Knothe were able to show that much could be learned from the study of the mucosal design which appears after complete evacuation of the opaque enema. In 1928 Bluhbaum, Frick and Kalkbrenner emphasized the advantages of using thorium salts instead of barium sulphate as contrast media in the opaque enema because thorium has a much higher atomic weight (232.2) than barium (137.36). They also succeeded in developing a thorium compound which coagulates in contact with the colonic mucosa for the purpose of producing an even coating for the double contrast examination.

In 1933 Garcia-Calderon and Ledoux-Lebard published some very interesting roentgenograms obtained by the use of a diluted barium enema, that is, of a medium opaque enough to give a good image of the contours of the viscus but also transparent enough to demonstrate polypoid lesions projecting into the intestinal lumen.

To Riegler, finally, must be given credit for the over-exposure technique by which the opacity of the ordinary barium suspension is penetrated by rays of suitable voltage. This technique, although used by Riegler for the demonstration of polypoid lesions in the stomach, is most useful in the radiological study of the colon.

The existence of such a variety of technical procedures is not surprising if one considers the difficulties of the radiological diagnosis of some colonic lesions. In order to choose from the various methods the ones most suited to the particular cases, we must examine in detail each one of them.

The opaque enema, carefully followed fluoroscopically as it fills the colon, is justly considered the basic procedure of examination. It is generally agreed that before injecting any contrast medium at all, the colon should be thoroughly cleansed of any fecal material. In order to ac-

complish this various methods may be employed. The patients should eat neither dinner the night before the examination nor breakfast in the morning. Castor oil (2 ounces) taken the night preceding the examination and followed in the morning by soap suds enemas gives a very satisfactory preparation. Saline purgatives are not to be recommended because they act by attracting water in the colon instead of stimulating its peristaltic activity. As a result, the intestine will still contain much fluid when barium is injected and this fluid will unduly decrease the opacity of the contrast medium. Enemas not preceded by castor oil should be employed only in debilitated patients, as they succeed in cleaning only the most distal parts of the colon.

As a good preparation is absolutely essential for a good examination, I may be forgiven for quoting details. In giving the cleansing enemas it is very common to inject into the bowel the air contained in the rubber tube. This can be avoided by letting some fluid escape before inserting the tip into the rectum. In spite of all precautions gas may reach the colon from the upper intestinal tract. As the presence of gas is quite disturbing it is advisable to ascertain the preparation of the patient with a preliminary picture of the abdomen. If this picture shows an abnormal amount of gas one may inject 1 cc. of pitressin. This drug seems to be quite effective and when injected intramuscularly it acts in 20-30 minutes by increasing the tone of the colon and so freeing it of gaseous collections. Pitressin also increases the blood pressure and should not be used in patients with hypertension: in these patients one must try to clean the colon of gas by means of additional enemas.

The preliminary picture of the abdomen is most useful not only to inform us about the preparation of the patient but also to disclose any abnormalities of other abdominal organs visible without the use of contrast media. It is only when the colon is sufficiently clean that one should proceed to the fluoroscopic examination by means of the opaque enema.

In preparing the opaque medium to be used for the injection one may employ barium salts suspended in water or the more costly thorium compounds. Barium is more generally used, is not expensive and can be considered a satisfactory medium if the suspension is prepared so that the salt will not deposit too early. Thorium



has the advantage of a greater opacity, and of a perfect stability; however, an opacity greater than that necessary for a good fluoroscopic examination is hardly desirable, and the stability of well prepared barium suspensions is sufficient for all practical purposes.

Before inserting the cannula, the air contained within the tube is allowed to escape. As the patient will be requested later to turn from side to side it is essential that the examiner use a tip which will not be easily expelled from the rectum. A tip which has a large end and a narrow neck will be easily retained by the sphincter. As the patients are usually apprehensive about the examination and their cooperation is essential, they should be told that the procedure is a short one and that since the examiner can see what he is doing any overdilation of the bowel will be avoided. They should also be requested to notify the examiner of any discomfort and to breathe easily and rather deeply during the whole examination, avoiding any effort to "bear down." It is essential that the contrast medium be injected at body temperature.

The fluoroscopic examination should begin with the patient between a supine and a left-sided position so as to expose better the distal loops of the sigmoid. By turning the patient on his back and then on his right side one will be able to dissociate these extremely coiled loops. While the patient is on the right side one can dissociate the two branches of the splenic flexure. The patient is then asked to turn on his back and the transverse colon is examined; then on the left side again to dissociate the two branches of the hepatic flexure. The cecum is usually well examined with the patient on his back but when it descends deep into the pelvis it may be necessary to turn the patient on one side or the other. The observer should make sure of the identity of the cecum by trying to see the appendix or the terminal ileum by reflux. Many mistakes have been made by not observing this rule, as a stenosing tumor of the cecum or a patch of colitis would not be detected. In the case that neither appendix nor terminal ileum can be visualized, barium should be given later by mouth and followed to the cecum. During the whole examination the observer should follow the head of the opaque column, as this often splits around a polypoid tumor and should use

his hand to flatten every accessible part of the colon in an effort to detect alterations of the mucosal lining.

A careful fluoroscopic examination should never be omitted, as it is the most important part of the radiological investigation; however, one must understand its many limitations. The image is rather indistinct, the time is necessarily short, the length of the organ is considerable, its coiled loops necessitate frequent changes in the position of the patient. It may be said that the lesions detectable by the average examiner on fluoroscopic examination are those that deform the contours of the bowel in a considerable manner, such as rather extensive chronic ulcerative colitis, tumors larger than 2 cm., marked amebic or tuberculous involvement of the intestinal walls. Finer and smaller lesions which do not induce marked deformity of the wall of the bowel (initial colitis, small carcinoma, small polypoid lesions) especially when situated in the coiled loops of the sigmoid, will often escape the most painstaking fluoroscopic examination.

At the end of the fluoroscopic examination it is the custom of many radiologists to take a picture of the whole colon with the patient lying on his abdomen. In order to dissociate the loops of the lower sigmoid it is often necessary to take another roentgenogram of the patient between a supine and a left-sided position. The roentgenograms should be taken in apnea with Bucky diaphragm and with an exposure not exceeding two seconds. The pictures obtained will give a better definition to the shadows previously observed in fluoroscopy and will make it possible to study small alterations of contour which are often the early signs of ulcerative colitis. After taking the roentgenograms the patient is allowed to evacuate the bowels.

Forssell, Berg and Knothe have emphasized the importance of studying the colonic mucosa after evacuation of the enema. For this examination roentgenograms are taken when only enough barium remains in the colon to coat the mucosal lining. This ideal condition is, however, seldom obtained over the whole length of the organ because in the majority of the cases enough barium is retained to obscure the mucosa of a considerable part of the intestine. When the barium is not completely expelled one can try to facilitate its evacuation by fluoroscopic manipulation. If this is unsuccessful, roentgeno-

grams taken with compression (so as to flatten the intestinal walls, one against the other) may be employed here as in the duodenal cap, but often such technique becomes impractical because of the length of the viscus and because the distal loops, which are the frequent seat of pathology, are inaccessible to compression since they are situated deep in the pelvis. I believe that it can be said that although a roentgenogram after evacuation of the enema should always be taken, one seldom obtains a cast of the mucosa over the entire length of the colon.

The double contrast technique is an interesting and beautiful procedure which permits the exploration of the depth of the colon. It consists of the injection of air into the colon after the patient has evacuated his opaque enema. By this technique Fischer, in Germany, Weber, in this country, and many others, have been able to demonstrate exceedingly small polypoid lesions of the colon. When all the conditions are perfect, the brilliancy of such films has no equal. However, conditions are seldom perfect: the colon must be evacuated rather thoroughly but not too thoroughly in order to leave a thin film of barium on its walls to be distended by the air. If the evacuation is too complete the film of barium is too thin to give the double contrast effect; if it is not complete enough (and this happens more often) the barium will collect in pools in the most dependent parts of the bowel and these parts will not show any double contrast. Furthermore, if the patient is allowed more than five minutes for the emptying of his bowels, the film of barium will dry in the contracted areas of the intestine and appear chunky and irregular when distended by air. Where the emptying is insufficient an improvement in the image can be obtained by taking the roentgenograms in the upright position so as to allow the barium to collect in small pools instead of large ones; but even so, the amount of intestine without the double contrast effect remains great in the majority of the patients. The difficulties inherent to this technique, as well as the fact that the interpretation of the images obtained is somewhat different from the classical ones, have kept it from becoming of general use.

The examination with semi-transparent media aims at obtaining information about the mucosal lining and small intraluminal lesions without relying on the uncertain evacuation of the colon.

Barium in low concentration in water, has been used by Garcia and Calderon, but in my experience this medium deposits too soon after the injection. For this examination Thorium dioxide (Umbrator 20% in water) should be employed because it does not deposit even when used in very low concentrations. The solution is injected under fluoroscopic control and followed to the cecum. Roentgenograms are then taken in a prone position with the usual technique and the patient allowed to evacuate the bowels. While the fluoroscopic image lacks the necessary contrast for a good examination, the roentgenograms will show surprising detail as polypoid lesions or air bubbles as small as 2 mm. become evident. The sensitivity of this method is somewhat dangerous because one may mistake an air bubble or some fecal material for an organic lesion. In those cases in which one is not sure of the significance of abnormal shadows an additional roentgenogram in the upright position may be taken. This will send the light fecal material and air bubbles to the uppermost parts of the colon, heavy fecal material will sink to the bottom and organic lesions will keep their position. Owing to the extreme sensitivity of the method, it is imperative that the colon be cleaned in a thorough manner preceding the examination.

When the patient returns from the toilet the investigation must be completed with a fully opaque barium enema, which will allow a good fluoroscopic examination. After evacuation of this second enema, a roentgenogram may be taken to study the mucosal design according to Berg and Forssell.

The semi-transparent technique, in my experience, has proved very satisfactory for radiographic purposes, but the medium is too thin for a good fluoroscopy; the examination becomes quite expensive because of the cost of the medium; two enemas are necessary, and in the majority of patients the same results can be obtained in a different way.

Most radiologists use an excessive amount of barium in the preparation of the opaque enema. The reason for this is the desire to obtain a good opacity for the fluoroscopic examination. Now if a good fluoroscopic opacity is obtained by a given suspension any addition of barium will not increase this opacity any further because



all the rays will have already been absorbed by the existing opaque material.

This reasoning prompted me to find out what percentage of barium to water could be called opaque when the fluoroscopic examination is conducted by means of rays obtained at 75-90 KW and 4 MA. After numerous trials I have found that a proportion of 20% barium in water (by volume) would satisfy all the opacity requirements of the fluoroscopic work.

Barium of such a concentration is quite opaque fluoroscopically, but it becomes more and more transparent as we increase the voltage for radiographic purposes. By taking the roentgenogram at 95-100 KW, 50 MA, 30" distance, Bucky diaphragm, 2 seconds, one can easily see through the loops of the colon and discover small intraluminal lesions in all patients whose abdomens do not exceed 12 inches in thickness. This fact makes it possible to obtain the radiographic advantages of the semi-transparent media by employing a barium suspension of an opacity that allows a satisfactory fluoroscopic examination as well.

At the present time I divide my patients into two classes. The thin patients are examined as follows: barium enemas followed by fluoroscopic examination and by overexposed roentgenograms; a roentgenogram after evacuation is also taken. The heavier patients are examined as described with the semi-transparent medium followed by a fully opaque barium enema for fluoroscopic purposes and for the study of the mucosa after evacuation.

	Number of cases	Number of Satisfactory Examinations	Extent of Visualization in Satisfactory Examinations	Causes of Failure
Fluoroscopic examination with barium enema	20	20	Whole colon	
Radiographic study of the mucosal pattern	20	3	70% of the length of the colon or more	Insufficient or too complete evacuation.
Double contrast (Patient Prone)	20	2	70% of the colon or more	Dehydration of barium film
Double contrast (Patient upright)	20	5	70% of the colon or more	
Semitransparent medium	20	18	Whole colon	Poor preparation
Overexposure technique	20	16	Whole colon	Abdomen too thick to allow penetration of barium by Roentgen rays.

In order to obtain an idea of the comparative value of the various techniques described, I have studied twenty examples of each chosen at random. The fluoroscopic examination by means of a fully opaque barium enema was satisfactory in all cases. The study of the mucosa after evacuation of the enema could be accomplished over 70% of the length of the colon in only three cases. The double contrast method with pictures taken in a prone position visualized over 70% of the length of the colon in only two cases; the same method when the roentgenograms were taken in an upright position visualized over 70% of the colon in five cases. The semi-transparent medium visualized the whole colon in all cases but was unsatisfactory in two patients because of poor preparation. The overexposure technique succeeded in fourteen thin individuals. In the remaining six cases the thickness of the abdomen did not allow the rays to penetrate the barium.

Although it is rather difficult to make definite statements, it seems to me that the methods that rely upon the evacuation of the colon for the demonstration of small lesions are often subject to failure because of incomplete evacuation of the contrast medium. Although these methods should be kept in mind and utilized when possible, I believe that the semi-transparent media and the overexposure technique allow more frequently a complete roentgenographic examination of the colon. The fluoroscopic examination with a fully opaque barium enema should always constitute the basic technical procedure.

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### DISCUSSION

Dr. M. J. Hubeny, Chicago: Mr. Chairman and Members: What I have to say really does not concern you so much, because you already know what I intend to say. The only thing I regret is that the Doctor's paper was not presented before a joint session of medicine, surgery and radiology. Some seem to decry the fact that the so-called laboratory methods are methods of precision.

I was interested in the method of approach which the Doctor gave to the subject. He exhausted all the physical means of which we know, was not over-enthusiased about any, placed them in their proper evaluation. I believe radiology will be put on the horizon more and more by such proper and scientific evaluation of our limitations and possibilities. For some reason there seems to be rather a peculiar attitude toward the roentgenologist, when they think only of the technical or manual process and do not think of the intellectual aspect of his work. As a matter of fact, he renders services like any other branch of medicine, usually divided into two categories.

First, the manual or technical phase; second, the intellectual aspect, which depends on judgment ripened by experience. Frequently the technical work is time consuming as well as exacting, entails considerable expense; this is unavoidable. Therefore, I think a paper of this kind is valuable in impressing the rest of the medical profession of the thoroughness with which our technical work must be done in order to deduce properly.

We had an instance not so long ago of an eminent proctologist who sends his cases to a technician who injects the enema and takes one film. I asked the proctologist if he had done any fluoroscopy in the case. He said he had not. I asked if he had any more films and he said he did not. I asked if he followed the case after evacuation of the enema and he said he did not. It is a concrete citation of men who should know better than to have such an attitude toward a scientific and precise method such as Dr. Gianturco has expounded.

I had access to the manuscript and because of the limitation of time the Doctor was not able to touch upon many of the things he mentioned in the manuscript. I think much importance should be attached to the question of continuous examination after the evacuation of an enema. In the determination of a pathologic appendix or the presence of diverticulae, it is necessary to examine the patient for one or two days after the injection of an opaque enema.

Regarding mucosal patterns, we must be careful, they are so varied even in normal individuals that re-examination might be necessary.

It is the critical areas that we have to watch such as the terminal ileum, cecum, hepatic flexure, pelvic colon and rectum. Also, it is practically impossible to completely clean out the colon, consequently this source

of error must be thought of. Another confusion arises in the presence of many sphincters which might simulate spasms or new growths; should this exist re-examination is indicated.

I am pleased to have had the privilege of discussing this paper. We are aware of those things and wish we could make the rest of the medical profession understand there is such a thing as being very thorough. It is quite as necessary to make a diagnosis as it is to be able to perform a good surgical interference. Such painstaking work as the Doctor has given us today will make roentgenology more appreciated.

Dr. H. A. Olin, Chicago: I would like to recite an experience I had in trying to make a diagnosis of malignancy of the colon in an old man of seventy-two. He weighed about 242 pounds and was very uncooperative. I gave him a barium enema and after observing him for about an hour, using very low pressure, I could get the enema fluid to proceed no further than to the distal part of the descending colon. I had him in various positions and still had no success. I took several plates in the incumbent and prone positions and it confirmed the fluoroscopic findings. There was a possibility of obstruction somewhere in the distal descending colon. I did not want to inflate him with air because I thought it would make the obstruction worse and the possibility of subsequent surgery made me exclude the procedure. I then decided to give him a small amount of barium from above, thinking if I could get the barium around the descending colon I would get further evidence. It was impossible to palpate him—his belly was so thick, and I could gain no information that way. He had a very peculiar history which probably may be rather vague. There was no loss in weight but for two years he had vague pains in the lower left quadrant and had some difficulty in having his bowels move the last two weeks because of the increasing pain and the change in bowel habits. He was brought into the hospital for study of possible malignancy and, of course, obstruction. I had him under observation up to thirty-six hours and then had to leave for Springfield. I have not settled in my own mind just what the diagnosis may be because I have not seen the film. Barium at the end of thirty-six hours only reached the splenic flexion. I have been wondering in my own mind because of the mental attitude of the patient and his lack of cooperation if I were dealing with a spasm. I have seen it in a doctor's wife who became very emotional. I was to do a barium enema on her. She was so excitable the fluid did not proceed any further than the sigmoid. The following day, under the administration of atropin she showed a normal colon. I would like to be enlightened as to what procedure I should pursue in the case I mentioned, whether to try this patient under the use of atropin. I certainly am not satisfied with what I have done and would like to receive some information as to what is the method of choice.

Dr. Gianturco: I desire to thank Dr. Hubeny and Dr. Olin for their kind discussion of my paper. I doubt that I can answer Dr. Olin's question in a definite way,



but I believe that the procedure he has adopted in the case he described is the most likely one to give results. The arrest of the barium column at the sigmoid flexure is not a rare occurrence, but some deep breaths or waiting a few seconds will usually reestablish the flow. The use of atropine is, in my opinion, quite useful when one wants to differentiate spastic from inflammatory phenomena; this is very important in cases of diverticulitis and in ulcerative processes.

## MANAGEMENT OF ARTHRITIS

ROGER T. FARLEY, M. D.

CHICAGO

The incidence of arthritis is so general that the management and control of it are of widespread interest. Since the publication of the research of Dreyer and Reed,<sup>1</sup> I have been interested in the treatment and control of arthritis by means and methods that are somewhat advanced at this time, including the use of anti-arthritic agents for the relief and control of arthritis in general.

Hench, Bauer, Fletcher, Christ, Hall and White,<sup>2</sup> and many others have earnestly studied the arthritis problem but are today far apart as to its etiology and therapeutics. It is therefore clear that any measure which will give any real degree of relief to arthritics is greatly to be desired.

The patients referred to in this paper were entirely unselected, being one group appearing in the author's private practice and remaining under treatment sufficiently long to make valid data for a report. Some of this group were treated for the first time, while others had received treatment elsewhere over periods as long

as five or six years. The latter group, for the most part, had not been benefited by the former forms of therapy.

*Therapeutic Management.* The entire group was given high vitamin D therapy.<sup>3</sup> The preparation used is a capsule containing 50,000 or 100,000 U.S.P. (I.U.) units of vitamin D. The initial dosage was usually 200,000 units per day. This dosage was increased in obstinate cases to 300,000-600,000 units per day and in one case to 1,000,000 units per day. The higher dosages were administered only when the patient was in the hospital where close observation was possible. In the usual case a daily dose of 200,000 units or more as indicated was maintained throughout the period of treatment. We were constantly alert, when administering the higher charges, for the appearance of the symptoms of overdosage. These symptoms usually consist of dizziness, nausea, increased micturition and slight diarrhea, and seldom appear on dosages under 400,000 units per day. Upon reducing the charge to 200,000 units per day or less the symptoms promptly disappear and subsequently the dose may be increased without the reappearance of these symptoms. In a few cases where



Fig. 1. Case 5689. Male, 61 years. Knee and hand before treatment. Case 5260 showed deformities similar and worse generally to Case 5689.



Fig. 2. Case 5260. Male, 41 years. After 5 months treatment showing movement restored to all joints except left wrist. Nutritional restoration general, 47 pounds gain.

dizziness or nausea resulted from the low charge of 200,000 units per day, it could be controlled by the administration of brewer's yeast. This measure is also effective in maintaining a patient on a higher dosage than would have been otherwise possible.

The diets of the patients have been regulated or advised along the lines of natural foods. Dishes containing adequate quantities of uncooked fruits and vegetables selected from those known to be excellent sources of vitamins and minerals, are advised.

In especially severe or stubborn cases, when the economic status of the patient would permit, we have used hyperpyrexia. The particular apparatus used was the high frequency coil type enclosed in a cabinet. The cabinet temperature never rises above 100° F. while the induced temperature of the patient may rise to as much as 108° F., at which level it may be maintained for four to eight hours without greatly fatiguing the patient. Observations show that the heart rate does not follow the temperature as is found in other forms of fever. The heart rate seldom increases above 110 beats per minute. Hyperpyrexia itself has no lasting effect upon the course of arthritis. As an adjunct to the mass charge of vitamin D therapy, it is sometimes desirable.

Chemical analysis of blood, urine and feces does not show the serious condition of the patient under present laboratory methods. However, observations made on this group show a rapid blood sedimentation reaching as high as 37 m.m. in sixty minutes; as improvement takes place the sedimentation becomes slower. Blood calcium and phosphorus remain constant within the normal range. Two cases only of this group were outside the normal range.



Fig. 3. Case 5260. Showing nutritional restoration of shoulder and arm.

A brief description of a few of the 27 cases upon which this report is made, follows:

4984: Female, aged 60 years: This was a pronounced case of atrophic arthritis affecting the hands, elbows, shoulders, wrists and ankles. She was unable to walk into the hospital and experienced much pain. She was given 200,000 units of vitamin D daily and one hyperpyrexia treatment per week. At the end of one month she was entirely pain free and the movement of her joints was improving. She was discharged from the hospital to continue the vitamin D therapy in her home. She has continued to improve sufficiently that we believe normal movements of her joints will result.

5122: Male, aged 67 years: This was an ambulatory case of chronic atrophic arthritis. The main complaint of the patient was pain. He received 200,000 units of vitamin D per day and one hyperpyrexia treatment per week during his stay of six weeks in the hospital.

At the time of his discharge, he was pain free and has remained so.

5310: Female, aged 55 years: This was a severe case of acute atrophic arthritis. Pain and stiffness was found in practically all of her joints, including the jaw. Her blood pressure was 208/134. She was given 200,000 units of vitamin D daily and one hyperpyrexia treatment per week. She remained in the hospital for three weeks, during which time the pain and stiffness in the joints were so reduced that she could again care for herself. At the time of her discharge her blood pressure was 152/110. Since returning home she has continued the treatment and has improved so much that



Fig. 4. Case 5260. Left wrist showing some motion due to lessened calcium deposits.



she now can care for herself in every way and sew and knit.

5342: Female, aged 72 years: This was a case of atrophic arthritis of long standing. She complained of the great pain. She remained in the hospital for two months during which time she was given 200,000 units of vitamin D daily and one hyperpyrexia treatment per week. Her pain was entirely relieved and she insisted on returning to her home where the vitamin D therapy has been continued. Her physician reports that the improvement has continued.

5689: Male, aged 61 years: This is a case of chronic atrophic arthritis of four and a half years' standing. He has a long hospital record in Chicago, testifying that his condition was becoming more and more severe. He experienced severe and constant pain and nearly all of his joints were affected. He entered the hospital entirely incapacitated. He was given 200,000 units of vitamin D per day and one hyperpyrexia treatment per week. At the end of ten weeks in the hospital his pain was greatly relieved and some of his joints less rigid. The vitamin D therapy has been continued in his home. He has continued to improve and is now able to care for himself in every way.

5260: Male, aged 41 years: This is a case of arthritis deformans. The patient has a long record in Chicago hospitals and was progressively becoming rigid and experiencing so much pain that narcotics were necessary to enable him to rest. He entered the hospital on a stretcher, being totally incapacitated. Every joint in his body was ankylosed to some degree. During his stay in the hospital from October, 1935, to



Fig. 5. Case 5260. Left wrist immovable ankylosed.

February, 1936, he received from 200,000 to 1,000,000 units of vitamin D per day. He was also given hyperpyrexia treatments once or twice each week. During the five months of hospital treatment the pain was so



Fig. 6. Case 5260. Left wrist, particularly, x-ray showing flow of calcium away from deposited areas and cartilage restoration. There is now, one year from beginning of treatment, movement in a formerly completely ankylosed wrist.

relieved that sedatives were no longer necessary. His general state was greatly improved, having gained forty pounds of body weight. Some of his joints, particularly the knees and ankles, showed greater motion and none of his joints were ankylosed to any greater degree than at time of entry. His improvement was so great that he walked with assistance from the hospital. He has continued the vitamin D treatment in his home. At this time, after eight months of treatment, he not only dresses himself but attends to all of his personal needs. So far as we can tell the disease has been stopped in all of the affected parts of the body. A recent picture of the patient is shown. It will be noted that his knees are almost normal; his hips and back allow him to stand erectly; and his shoulders and neck allow rotation of the head and arms. It will be noted that his nutritional state is good. We hope for a complete cure in this patient.

#### SUMMARY

The use of mass charges of vitamin D per orem in the treatment of arthritis has been followed in a group of 27 private patients. In no case have uncontrollable, untoward symptoms been observed. The slight dizziness or nausea which develops in those patients receiving higher dosages, can be reduced or controlled by brewer's yeast. In severe cases of atrophic arthritis, the reduction or disappearance of pain was observed. The x-rays have shown remarkable reparative changes in the joints consisting of filling in of the rarefied regions and reconstruction of cartilage. In severe cases of hypertrophic arthritis, granular resorption of exostoses, particularly on vertebrae and reconstruction of cartilage takes place. Not a single one of this group has failed to respond in some degree to the high vitamin D therapy.

In this group not only were the symptoms of pain and reduced movement of joints relieved, but the general nutritive state was greatly improved by the therapy above outlined. This was manifested by the gain in weight, appearance and feeling of well being.

There is in the mass charge of vitamin D, a new therapeutic measure which appears to offer much hope in the treatment of arthritis and kindred conditions.

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3. Ertrou.

#### ANKYLOSED JOINTS GENERAL

Case 5260: Oct. 22, 1935. Weight, 107 lbs.; height, 6 ft.; 6 years' duration; 2 years' complete helplessness, generalized immobility of joints with calcium deposits and ankylosis, pain positive. General laboratory routine showed negative, except blood sedimentation 31 mm. in 60 minutes and many immature corpuscular elements in blood.

Nov. 10, 1936. Sedimentation now normal, immature corpuscular elements disappeared after two weeks vitamin D. Weight now 150 lbs., locomotion without crutch or cane.

#### X-RAYS ARE OF SAME CASE

Right wrist had complete motion and freedom from pain in five months.

Left wrist began to move and function in motion at nine months.

All other joints seem to have gone through same restoration of function.

Patient able to lift and carry 75 lb. weight in addition of or to his own weight.

#### THE PRINCIPLES OF RADIUM THERAPY IN MALIGNANCY

FRANK EDWARD SIMPSON, M. D.

CHICAGO

The literature dealing with radium therapy is voluminous yet confusing and contradictory. Claims are often made for radium that are not justified.

One gets the impression from the pamphlets of commercial organizations which rent radium and sell radon "seeds" that radium treatment is simple and may be used by anyone. The exact opposite is the truth.

Radium therapy has become a very highly specialized and complex subject, requiring long study and experience both to avoid injuring patients and to select cases that are really suitable for radium treatment.

Especially in the treatment of cancer, in which the patient's life is at stake, it requires a large and expensive equipment and great skill to bring cases to a successful conclusion.

Ewing<sup>1</sup> says, "The wisdom of employing irradiation in cancer depends first of all on the competence and equipment of the operator." Unfortunately, as every one knows, the radium

<sup>1</sup>Read before Section on Radiology, Illinois State Medical Society, Springfield, May 20, 1936.



therapist as well as the surgeon fails frequently to cure cancer.

Sometimes the failure of radium is due to the character of the disease; sometimes to the way in which the radium is used, or perhaps abused.

If greater success is to attend cancer therapy, there must be cooperation between the family doctor, the surgeon and the radium therapist.

The family doctor must see patients in time; the surgeon must operate in time; the radium therapist must treat them in time.

Only by such cooperation can there be much hope for a decrease in cancer mortality.

*Clinical effect of radium rays.* The main principle involved in radium therapy is that the radio sensitivity of certain neoplastic cells is greater than that of the normal cells surrounding the tumor.

The clinical effect of radium depends on the technic employed.

The quantity of radio active material, the screening, the distance from the neoplasm, the length of exposure and the type of neoplasm are some of the chief factors to be considered in the use of radium. All of these may be so greatly varied as frequently to render the technical application of radium a difficult problem even for the expert.

Wood and Prime<sup>2</sup> have shown experimentally that Beta rays are 6 to 8 times as lethal to the cancer cell as Gamma rays. We cannot agree therefore with those who restrict the use of radium and employ Gamma ray therapy only.

We believe, on the other hand, that Beta rays are often of the greatest value, as in the treatment of superficial epitheliomas.

It is very important to estimate the exact distance of the radium from the neoplasm. The terms milligram and millicurie hours mean nothing whatever, unless all the factors that govern the technique and especially the distance are known.

When a tumor is radio sensitive, it may disappear under radium without visible inflammatory reaction—the so-called “selective” action.

Some cases of lymphosarcoma may be clinically cured in this way. With tumors that are radio resistant, such as squamous cell cancer of the lip, one must usually invoke the “inflammatory” action of radium.

The selective effect of radium should be used

whenever possible in order to conserve normal tissues and spare the patient unnecessary discomfort. For the best effects of radium on a neoplasm there should be a good substructure of muscular and connective tissue.

*Microscopic effects of radium rays.* Radium rays act as “selective poisons to cell reproduction.” Injury and destruction of the nucleus of the carcinoma cell is one of the chief effects of the rays. The cell is particularly sensitive during mitosis and especially at the culminating point of mitosis. There are, however, other changes of far reaching importance in the curative process. These consist chiefly of obliteration of blood vessels, stimulation of phagocytosis, production of fibrosis, etc.

In the radium treatment of cancer one relies, therefore, on two chief factors:

1. Direct action of the rays by which the equilibrium of the molecular structure of the cancer cell is disturbed resulting in its death.
2. Indirect action on the tumor bed so that the circulation is modified and local defense processes are stimulated.

Both of the above actions may be explained in terms of the absorption process.

The absorption of the gamma rays may result from the photoelectric effect, which means that a high speed Beta ray is ejected when the gamma ray encounters matter. There may be present the so-called Compton scattering, which produces not only a secondary Beta ray but a modified Gamma ray.

Both absorption processes mean the transference of energy from the incident Gamma or Beta ray beam to the tissues.

*Treatment of the tumor bed.* It has been demonstrated by animal experimentation that irradiation of the surrounding region in addition to irradiation of the tumor itself produces better results than when the tumor alone is treated. Clinical experience corroborates these experiments.

As a consequence of this knowledge, we no longer try to screen off the surrounding tissues by lead or gold screens but we always include in the irradiation all of the area adjacent to the tumor, provided the anatomical conditions permit.

The experiments of Lazarus-Barlow<sup>3</sup> and others have shown that the good effects of irradiation

tion may be increased by a certain prolongation of the time of irradiation.

By spreading the dose over several days or weeks, injury to normal tissues which reproduce slowly may be reduced while injury to cancer cells which reproduce rapidly may be increased.

In Roentgen therapy, Coutard<sup>4</sup> has stressed the utility of the multiple divided dose method.

Coutard's plan is to give in certain types of intraoral carcinoma daily exposures to Roentgen rays, maximal irradiation being arranged if possible in accordance with the estimated periodicity or recurrence of maximal sensitivity in the neoplasm.

In 1925, Holzknicht<sup>5</sup> said: "If one is fortunate enough to strike the right day for the second irradiation the effect is 2 or 3 times as great as when the total dose is given in one sitting. The difficulty lies in determining the correct interval of days."

In radium therapy the multiple divided dose method has been used almost from the beginning.

In 1921, the author<sup>6</sup> pointed out that in malignancy several intensive doses at suitable intervals are to be preferred to a single intensive dose.

We believe the intraoral application of radium in carcinoma of the buccal cavity is much to be preferred to Roentgen therapy.

In Roentgen therapy, the rays, if applied from the skin surface, pass through the structures overlying the tumor and may cause great damage to normal tissues. In radium therapy, the radium may be applied directly to the neoplasm from the inside of the mouth, so that overlying structures are relatively little or not at all damaged.

We wish to warn those who undertake to give the relatively large total doses of x-rays employed by Coutard and his followers. Little if anything has been said about the pain following the complete cycle of treatment recommended by Coutard or the ultimate results of these large doses—the so-called epidermicidal dose—on the skin and the underlying tissues. We predict that in a few years atrophy, telangiectasia, chronic, intractable, painful ulcerations and epithelioma of the skin, together with severe fibrosis of the underlying tissues may be found to result from a too slavish use of the Coutard method.

We have seen untoward results follow severe radium reactions as long as 15 or 20 years after

the reaction has apparently healed, and we believe disastrous results may be anticipated, but in greater degree, from x-ray reactions.

*Metastases.* In the treatment of carcinoma, it is not so much the problem of the cure of the primary local lesion as it is the cure of the metastases that one has to solve.

Among the factors apparently favoring metastasis there are two—the microscopic structure of the tumor and traumatism—which we wish to mention briefly.

*Microscopic structure.* In 1920 Broders<sup>7</sup> presented evidence indicating that the nearer the cancer cell approached the normal, the less malignant was the tumor i.e. the less likelihood of metastasis. On the other hand, the more the cancer cell approached the embryonal type, the more malignant the cancer.

In addition, a large number of mitotic figures indicated increased malignancy. In this way Broders distinguished 4 groups or grades of malignancy, depending on the microscopic structure of the tumor.

Lacassagne<sup>8</sup> says:—"Attempts to classify cancers from small biopsies into more or less radio sensitive groups depending on the degree of differentiation of the cells or according to numerical enumeration of mitotic figures have not been uniformly successful.

"The histological characteristics of a cancer may vary in its different parts and this cannot be appreciated by examination of a small specimen which frequently represents only a surface biopsy. Since it is usually impossible to predict with certainty the radiation dose which will be needed to destroy completely a particular cancer, the largest dose compatible with maintaining the integrity of healthy tissues is usually given."

*Traumatism.* F. C. Wood<sup>9</sup> has shown that if animal tumors are massaged gently for a few minutes on successive days, the number of metastases to the lungs is greatly increased over those found in the controls.

Clinical experience has shown that methods of treating cancer, which traumatize without completely destroying it, may result both in increased local growth and the development of metastases.

Cancer may be traumatized in various ways, such as by rubbing, squeezing, partial excision, cauterization, electrocoagulation, etc. A com-



mon expression that one hears is "partially remove," "curette" or "cauterize" the cancer and then follow this treatment with radium.

We are entirely opposed to these procedures, not only because the neoplasm may be stimulated and metastasis favored but because the best effects of radium are obtained when the tumor bed is conserved.

*Examination of cancer patients.* We have a great respect for lesions which may be cancerous. The older physicians used the term—"noli me tangere"—do not touch me—to characterize a cancerous lesion.

Long experience teaches that the approach to the examination of cancer should be as gentle as possible.

Cancer of accessible organs such as the skin, lip, tongue, buccal cavity, cervix uteri, etc., may usually be diagnosed by inspection alone.

Complete examinations are desirable, but they should be carried out so that the involved parts are not traumatized.

*Diagnosis.* Although one may frequently make a diagnosis of malignancy clinically, the diagnosis should be confirmed by the microscope. Errors are thus minimized and one is protected from future claims that cancer was not present. We have not infrequently seen cancer diagnosed and radium applied to or even implanted in a lesion, when further investigation has shown that the lesion was luetic, yielding only to anti-luetic treatment. On the other hand, hues may be diagnosed clinically and anti-luetic treatment given and persisted in almost indefinitely, when carcinoma is present but unrecognized.

These are perhaps the two most common errors which may easily be avoided by a biopsy. We believe the microscopic examination of tissue is more important than a positive or negative Wassermann.

*The selection of cases.* Shall one use surgery or radium in the treatment of cancer? This question cannot always be definitely answered. We have always maintained that, with certain notable exceptions, operable cancer should be operated on. There may of course be some difference of opinion as to what is operable and inoperable. James Ewing once said that patients naturally prefer a non-operative method and will submit to it earlier. For this reason, perhaps, many cases have been treated with radium

which experience has shown are not suitable for irradiation.

On the other hand, many patients are doubtless operated on today who would be far better off under radium.

Fortunately, it is possible to state in general terms the class of cases that the experience of the world in the last 25 years indicates are most suitable for radium.

Among the conditions in which it is justifiable to use radium, even though they are operable, are selected cases of cancer of the skin, lip, buccal cavity, tongue and the cervix uteri.

Almost every case is a problem in itself, however, and should be treated by a generous co-operation of the surgeon who is familiar with radium therapy and the radium therapist who is familiar with surgery.

We wish now to consider the radium treatment of a few common conditions in which radium has been found to be of value.

*X-ray Keratoses.* In the treatment of x-ray keratoses, we believe radium is superior to excision. Abbe<sup>10</sup> pointed out many years ago that small epitheliomas due to x-rays may be healed with radium.

*Radium Keratoses.* These are, of course, much less common than x-ray keratoses. We know of only one authentic case in which epithelioma supervened on a radium keratosis, although other cases have probably occurred.

About ten years ago, a physicist engaged in radium work developed a radium keratosis on his right index finger. In spite of many warnings, this was allowed to progress into an epithelioma which metastasized and finally caused death from lung involvement.

We have not found in the literature any mention of the fact that radium keratoses, the result of slight but long continued local exposures to radium, may be cured by giving a sharp dose with radium applied to the surface of the lesion.

In the case of a physician, engaged for many years in radium work, a number of radium keratoses developed on both thumbs and forefingers. Excision was performed but after a few years recurrence of the keratoses took place. Although amputation of the distal joints was suggested, we decided to try giving a sharp sub-epithelioma dose with radium. The result was good, the fingers now being free of keratoses. The nail of the right forefinger which had become thick-

ened, striated and friable, as the result of excision of a wedge of tissue from the flexor surface of the distal phalanx, has become almost normal, apparently as the result of the radium treatment of the keratosis.

We believe, therefore, the treatment of radium keratoses by radium itself is the method of choice.

*Epithelioma of the skin.* Most epitheliomas may be treated by radium. There are certain types of very extensive, deeply infiltrating, squamous cell epitheliomas which we believe should be excised.

For epitheliomas of the face, especially those affecting the eyelids, nose, and ears, radium is the method of choice. We always employ surface irradiations. We advise strongly against the use of "radium puncture."

*The lip.* With small lesions, we believe radium is preferable to surgery, partly because there is no deformity following treatment. With larger lesions, much depends on the judgment of the operator as to whether radium or surgery is indicated. If radium is used, we advocate surface irradiations with a minimum of 500 mc. which is applied daily for from 5 to 15 minutes until the dose has been given.

We advise very strongly against the implantation of radium needles of any type in carcinoma of the lip.

*The buccal cavity.* We believe radium should not be preceded by surgery, because of the unavoidable injury to the tumor bed.

We use, in almost all cases of carcinoma of the buccal cavity, surface irradiations rather than the implantation of radium needles or seeds."

The patient sits behind a heavy lead plate which is rolled between the operator and the patient. An applicator containing at least 500 or more mc. is laid gently on the growth for 5 minutes. This length of exposure is seldom exceeded. Treatments are given once or twice daily until the dose has been given. In addition, the growth is intensively treated with radium from the skin surface.

*The Tongue.* Cancer of the tongue should practically always be treated by "radium puncture" after a suitable amount of 3 minute, daily, surface irradiations with a powerful radium applicator, containing at least 500 mc. Formerly we were of the opinion that very advanced cases should receive only palliative treatment by irra-

diating the surface of the lesion and that "radium puncture" was not indicated when metastases were present.

Further experience has convinced us that, even in advanced cases, correct "radium puncture" gives more palliation than any other known medical or surgical measure.

We use lead radon tubules each containing approximately 0.5 mc. of radon which are implanted permanently in the tongue lesion. We published<sup>12</sup> a description of these tubules and the method of their use in 1932. We do not favor the use of radium needles which are implanted in the tongue and removed after the estimated dose has been given.

While excision of carcinoma of the tongue followed by radium treatment has been advocated by some surgeons, we are opposed to this method.

In our opinion, such a procedure is "putting the cart before the horse."

If columns of cancer cells persist at the edge after operation on the tongue, there is difficulty in eradicating them by irradiation.

The previous removal by excision or any other destructive method of a portion of the substance of the tongue takes away muscular and connective tissue necessary for the normal tissue reaction which is so essential for the best effects of radium. Few appear to realize the harm that may be done by cauterizing or incompletely excising cancer and then trying to cure it with radium, when the tumor bed has been irreparably damaged. We believe most radium therapists and surgeons of experience will agree with Lacasagne<sup>9</sup> who says, "there is no question that radium puncture is at present the most efficient method of treatment of these lesions. The difficulty of obtaining a clinical cure in cancer of the tongue is not due to the primary lesion but to the glandular metastases."

*Metastases.* In cancer of the lip, buccal cavity and tongue, we advocate conservative excision of the lymph nodes combined with irradiation of the nodes from the skin surface.

We advise against the implantation of radium or radon in carcinomatous lymph nodes. For a further discussion of this topic, the reader is referred to a previous paper by the writer.<sup>6</sup>

*Cancer of the breast.* Every surgeon knows that the chief danger to the patient in cancer of the breast lies in the metastases.

If the primary lesion can be completely re-



moved before metastasis has taken place, the patient may remain well.

In some quarters, the implantation of radium in the primary breast tumor has been advocated even in clearly operable cases. Why this practice should be recommended is a complete mystery. Does the implantation of radium offer any better chance of eliminating or destroying every cancer cell in the breast than surgical removal? Everyone with experience knows that it does not, while the traumatism and manipulation incident to the implantation of radium in a breast tumor must to every thinking mind spell—metastasis.

The unavoidable pain and reaction consequent upon "radium puncture" of the breast are certainly very distressing. Radium necrosis of the skin is also greatly to be feared.

In our opinion, operable cancer of the breast should be operated on. Radium is an invaluable adjuvant to surgery but it should be applied to the surface only—never implanted in the primary breast tumor or the recurrences.

*Cancer of the cervix uteri.* Although operations are still being performed, we believe radium is the method of choice in practically all cases of cancer of the cervix.

*Preliminary treatment.* The variety of unsurgical procedures that have been advocated in connection with the radium treatment of cervical cancer is astonishing and perplexing. If a squamous cell cancer were situated in the oral cavity, few would contend that it would be good surgery to irrigate it, to scrape or cauterize or electrocoagulate the surface or to insert a dilator in its substance and pry it apart.

Surgeons would agree that the opening up of lymph and blood channels by any of these procedures would in all probability cause rapid dissemination of the growth. Yet all these measures are being used at the present time prior to or during the application of radium to the cancerous cervix. Our experience indicates that it is not the cervical tumor but the occurrence of metastasis that is so frequently fatal.

We are opposed therefore to traumatic examinations, douches, "pulling down" or dilating the cervix, curetting, "coppering,"<sup>11</sup> cauterization, electrocoagulation, partial operation, etc., preliminary to or during the course of radium treatment.

*European Technic.* A technic used for cervical cancer in a foreign clinic and widely copied in this country consists partly of the following procedures:

Treatment is begun by "disinfection" of the vaginal cavity, dilatation of the cervix and the introduction into the uterus of 3 radium tubes arranged tandem. At the same time, vaginal irradiation is accomplished by placing from 2 to 5 radium tubes in the vaginal vault. The intra-uterine applicator and the vaginal tubes are removed daily and disinfected. A vaginal douche is given and the applicators are reinserted. Irradiation is carried out over a period of 5 consecutive days.

As a result of this technic, one is not astonished to learn that 2% of primary deaths are caused by infection and that "phlebitis, pelvic cellulitis, periuterine abscess and pelvic peritonitis are occasionally met with." It is perhaps needless to say that we do not use this technic because of its evident dangers.

*"Radium Puncture."* Although recommended in some quarters, we are absolutely opposed to radium puncture as the primary line of attack in carcinoma of the cervix. Our reasons in part are as follows:

First, there is great danger of introducing infection into the deeper parts of the pelvis. A number of deaths from infection following this procedure have been reported. Any method that carries this element of danger ought to be abandoned when safe and equally efficient methods are available. Second, there is a great possibility of causing severe central necrosis without complete destruction of the carcinoma.

It is sometimes said that needles having thick gold or platinum walls do not produce necrosis. This is an absolute fallacy. No tissue can withstand death if placed sufficiently long in proximity to radium.

In patients treated with radium needles or by cauterization who have come subsequently under our observation, extreme pain is frequently complained of. One often sees in the vault of the vagina an area of necrosis surrounded by a zone of apparently inflammatory tissue, in which however, biopsy shows cancer cells. One is then confronted with a difficult and dangerous dilemma.

Shall one ignore the radium necrosis and treat the carcinoma still present or shall one delay

local treatment until the radium necrosis has somewhat subsided?

Under these conditions, one must be guided by experience because no constant rule of procedure can be laid down.

Unfortunately, such cases usually go on to a fatal termination under any method of treatment.

It is, of course, true that if a carcinoma is very small and confined to the cervix; if infection is slight and every carcinoma cell is destroyed by the radium needles, a cure may result.

We believe, however, that better results may be obtained by methods that are neither painful nor dangerous to the patient.

*The author's technic.* The method which we advocate consists essentially in an attempt to follow ordinary surgical principles in the application of radium.

One must consider infection, traumatism and the method of applying the radium.

*Infection.* The cancerous cervix is practically always infected.

If the discharge is dammed up, infection may spread to the parametria or peritoneum. We are opposed, therefore, to starting the treatment by plugging the cervix with a string of radium tubes. Fatal infection has followed this procedure.

*Traumatism.* We believe that traumatism of any kind to the cancerous cervix militates tremendously against the patient's permanent recovery by favoring metastasis.

We abstain therefore from all preliminary treatment such as douches, curettment, cauterization, etc., believing that such procedures are both futile and dangerous.

*Method of applying radium.* The technic, of course, must be varied to suit individual cases.

Before we attempt to invade the interior of the cervix, we irradiate the end of the cervix and lateral vaginal fornices with approximately 1000 mc. of radon by giving short applications each lasting 15 to 30 minutes on successive days. The rectum is protected with a gold screen.

Under this treatment hemorrhage rapidly ceases, infection quickly subsides and the cervical canal, if obstructed by the growth, opens up spontaneously under the influence of the irradiation.

We then introduce into the uterine canal, without dilatation of the cervix, a flexible lead screen

only 4 mm. in diameter and containing not less than 500 mc. of radon. A single intra-uterine treatment lasting 3 or 4 hours is given.

We rely very largely on the selective rather than the caustic action of radium so that there is seldom any necrosis of the cervix or adjacent tissues.

Hospitalization is unnecessary, most patients continuing their usual occupation.

Further details of this technic may be found in previous papers by the author.<sup>6</sup>

Much of the bad reputation that radium has in some quarters is due largely to its use by those unfamiliar with its possibilities for evil as well as good.

Correctly applied, radium is one of the most valuable agents ever introduced into medical practice.

Improperly used, its bad effects may far overbalance the good that may be done.

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#### DISCUSSION

Dr. Roswell T. Pettit, Ottawa: Dr. Simpson has covered the whole field of radium therapy and it would be impossible to discuss the paper in toto, but there



are two or three points I think I would like to emphasize.

I believe the basic principle of the use of radium in the light of our present knowledge as it has been developed at the Radium Institute in Paris, the fountain head of our knowledge of radium therapy, is the use of small amounts of radium over a prolonged period of time; getting all the cancer cells during some phase of mitosis; believing that their period of life cycle is some six or eight days. The treatment time should be a matter of days or weeks rather than a few hours. This idea of prolonged application is in use at the Radium Institute in Paris; at Stockholm Memorial Hospital, New York, and various other places throughout the world, it is the accepted method.

The method of treatment which Dr. Simpson uses, a thousand millicuries for ten or fifteen minutes, I hardly believe would meet the requirements which have been worked out by those who have given this study their attention.

I had an opportunity in 1933 to spend two months at the Radium Institute in Paris. In 1928 I spent about six or eight weeks at the Radium Hemmit in Stockholm. In Stockholm they use radium practically exclusively. In Paris, using a heavy filter, high voltage roentgen rays are applied over a prolonged period of time. I saw a number of these patients in both institutions who had been treated several years previously. The character of the skin was almost exactly the same, whether radium had been used or this very high filtered x-ray, but the character of the skin is decidedly different from what had been my experience in the use of x-ray in the treatment of carcinoma up to that time where we had used about half a millimeter of copper. The difference in the filter of half a millimeter of copper and two millimeters of copper made a very decided difference. For that reason I feel, in spite of the fact we have no scientific proof of the fact that the wave length has an important bearing upon the biologic effect and after having observed the work in Stockholm, in Paris and from my own experience in the treatment of my own cases, that wave length is a very important factor and that we are going to have to recognize it. I realize that Francis Carter Wood maintains emphatically as far as fruit flies are concerned, one wave length is the same as another.

In x-ray therapy we are subconsciously approaching the type of treatment given with the radium bomb at much less expense and just as or even more effectively.

E. G. C. Williams, M. D., Danville: There are two points of which the doctor spoke which I would like to emphasize. One is that the idea of milligram or millicurie hours means literally nothing unless all factors concerned are known, which indicates the fact that we have absolutely no concrete unit of measurement for radium therapy. In the matter of measurement in x-ray therapy we have advanced much further through use of an absolute unit of measurement. Because of this lack of a radium unit there is a demand that the man using radium have a definite knowledge and trained experience as the only basis for radium work.

Beyond any question there have been miracles and

wonders worked with radium in hands of those who know how to use it. By the same token, there has been a lot of very bad work done by those who just take radium and use it according to the printed pattern without knowledge of the background.

The other thing I would like to mention is the end result of the Coutard treatment, the hyperintensive treatment which seems only an increase in dosage over the idea proposed by Dr. Pfahler many years ago. If any of our patients who have had the Coutard treatment are alive long enough to have remote skin changes years after, I believe that is the only test that our treatment has been successful, because these people with carcinoma of the larynx and similar conditions are people without any other hope. I assure you I will take the responsibility of skin ulceration, skin change or anything else if by the use of this method I can keep these patients alive long enough to develop these remote effects.

Dr. Simpson (closing the discussion): I enjoyed the discussion and I think all that has been said is pertinent to the subject. Of course, cancer of the larynx should be taken out, if operable. If it is inoperable, I believe it is right to give severe x-ray or radium treatment. I do not know that the x-ray results would be any worse in late years than the radium results but the results of late radium reactions in the skin are bad and I believe with x-ray too there will be sooner or later very unsatisfactory results.

As to the method employed in Paris, I sometimes think large institutions fall into the habit of using a routine technic that either has not been clearly thought through or has been modified because of economic consideration. We cannot plug the cervix and put radium needles in without great danger. As I do not want to have anyone die as the result of my treatment, I am not much interested in this technic when better or at least as good results may be obtained without danger by another method.

As physicians with minds of our own I do not believe we should permit Paris or Stockholm to influence us to such an extent that we can not use our own judgment. I believe the things I have pointed out in their technic to be really dangerous and I am much opposed to them.

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A pathologic trilogy consisting of erythematous lupus, lichen planus and psoriasis has been described. In this syndrome pruritis is a prominent symptom. The author reports that injection of Pituitrin controls this symptom "as if by magic." It was 100 per cent effective in ten acute cases described and 50 per cent effective in the chronic type. Roussel, J. N., *South. M. J.* 29:811 (August) 1936.

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Absence of vitamin B<sub>1</sub> in the stomach contents of severely diabetic patients was revealed by spectrographic studies. This finding was in marked contrast to the findings in normal patients. A disturbance in vitamin B<sub>1</sub> metabolism is believed to be a prominent characteristic of diabetes mellitus. Lajos & Gerendas, *Z. exp. Med.* 98:739 (June 30) 1936.

SOME BASIC OBSERVATIONS ON THE  
TREATMENT OF GONORRHEA

LEON M. BEILIN, M. D.

CHICAGO

The treatment of gonorrhea is one of the most vexing problems of medicine. For a disease entity of known etiology, so common and widespread, gonorrhea is manifestly lacking general uniformity and standardization of treatment.

Those of us who have had the opportunity to observe the treatment of this infection in the army, clinics and private practice will undoubtedly agree that, while much progress has been made in recent years in the treatment of gonorrhea, our present therapeutic measure of combating it, in both men and women, particularly in the latter, are still a long way from being ideal.<sup>1</sup>

Our present-day treatment of gonorrhea is still as empirical as it has always been. For centuries the medical profession was endeavoring to cure gonorrhea through a direct gonococidal action of some chemical, by means of "therapia sterilisans magna", though this is entirely contrary to the whole rationale of the disease. If human urethrae were a simple tube without glands, crypts or rugae, it would be an easy matter to devise some mechanical or chemical wash-out which would kill the gonococci *in loco morbis*. Unfortunately, nature does not work in such a fashion. Finger, a co-worker of Neisser, in his treatise on the pathology of gonorrhea, written almost fifty years ago, had stated that when gonococci produce the inflammatory changes typical of the infection, they are already below the surface of the mucosa of the urethra, far beyond the reach of any antiseptics. Failure to recognize this basic fact and persistence in the use of local antiseptics to the point of irritation is responsible for many cases of chronicity and complications of gonorrhea.

There is no ideal drug in the treatment of gonorrhea, for the present, at least, since the same chemical action that forms a metal protein compound of the microplasm will also form a metal protein compound of the protoplasm, and the same force that oxidizes a microorganism will also injure the tissues. It is entirely possible that a chemical in time will be developed

that will exert a parasitotropic action on the gonococcus without having organotropic effect on the tissues of the host, but to date no compound has been developed which fulfills such requirements.

We must confess that in our arduous search for specifics we have often sinned against the cardinal warning: *nil nocere!*, and instead of treating the disease we have maltreated the patient.

We should not forget the "vis medicatrix naturae" and the admonition of Ricord, Fournier, Roux et al, "laissez conler" (let it run), rather than treating it "cum furore."

It can be justly said, that there is hardly a drug or combination of drugs that has not had its advocates and opponents in the treatment of gonorrhea. Each urologist lauds his pet drug today, only to discard it tomorrow for another would-be specific. The commercial houses, taking advantage of this, have flooded markets ad libitum with a great variety of nostrums for alleviating the ills of gonorrheal patients. These are mostly commercial butterflies—beautiful to look at, but of little value.

On theoretical and experimental bases, the silver salts, especially their colloids, seem best to comply with the requirements and desiderata for an efficient gonococide. The susceptibility of the gonococcus to silver compounds is conspicuous, though not actually specific. Schwartz and Davis<sup>2</sup> of Johns Hopkins University investigated the action of various drugs on gonococci, *in vitro*, and have found that:

1. Silvol, argyrol, protargol, cargentos have definite, but not high germicidal value against the gonococci.

2. Phenol, tricoresol, potassium permanganate, zinc sulphate, boric acid in dilutions tolerated by the urethra, have too little germicidal value against the gonococci to be useful in the treatment of gonorrheal urethritis.

3. Chlorazene has a moderate germicidal value.

4. Potassium mercuric iodide has high germicidal value against the gonococci, as dilution of 1:40,000 kills them in twenty minutes. This solution is rather toxic to the urethra.

5. Potassium permanganate in 1:4,000 dilution has failed to kill the gonococcus in twenty minutes. Gottlieb and Freeman<sup>3</sup> have shown that silver nitrate, in one per cent. solution, had

Read before Section on Public Health and Hygiene of the Illinois State Medical Society, Springfield, May 20, 1936.



failed to prevent the growth of gonococci in the culture media in 30% of their cases.

These laboratory experiments, in vitro, evidence the therapeutic limitation of chemical sterilization of gonococci in vivo, where they are further protected from the disinfectants by the forces inherent to bacterial habitation in the tissues of man. In general, the usefulness of any chemical agent, in vivo, is always limited by its toxic and irritant effect upon the tissues.

On an empirical basis, however, of all the chemical disinfectants in vogue at the present for the treatment of gonorrheal urethritis, potassium permanganate is most widely esteemed by the majority of the continental and American urologists who usually employ it by the Janet method of urethro-vesical irrigation.

The rationale of this treatment is not that of disinfection but merely that of mechanical cleansing, tending to the production of hyperemia, serous effusion and local leucocytosis. This method, when properly employed, is less traumatizing and physiologically more correct than the antiseptic method, which aims at the destruction of gonococci, in loco morbis, by means of injection of various germicides with a hand syringe.

The irrigation is manifestly a more rational treatment of total urethritis, i.e. of anterior-posterior involvement of the urethra, which, according to Janet, Keyes and others occurs in 60-80% of all gonorrheal infections, than the injection method. Injections tend to traumatize the urethra, causing strictures, paraurethritis, etc., owing to the difficulty of regulating the amount of liquids introduced into the urethrae, which differ in their capacities in various stages of gonorrheal infection. "Urethral syringe," said Janet, "is a pump without a manometer," and he advocates discarding the use of the urethral syringe, a method as useless as it is dangerous.<sup>4</sup>

While accepting Janet's dictum in principle, we however believe that it is not advisable to institute the deep irrigations at the onset of urethritis, but prefer to wait until acute symptoms subside; urethral discharge, strangury, dysuria lessen, and the urine become more opalescent. Complications of acute urethritis are not contraindications for total irrigations per se. To the contrary, in cases of prostatitis, vesiculitis and epididymitis, posterior urethritis usually being present, in our experience, the deep irri-

gation shortens the duration of the inflammatory process. Ballenger, stressing continuous, uninterrupted treatment of the entire urethra during complications, states that "it is necessary to continue the irrigations regardless of the occurrence of epididymitis, but precisely on account of its presence."<sup>5</sup>

Obviously, I do not wish to imply that I regard the Janet method of irrigation as a final development, le fait accompli, of the Neisserian therapy, but, from years of observation, I believe it to be more rational than other accepted methods, namely, the antiseptic method of syringing or that of "laissez couler" of letting it run.

*Internal Medication:* The oral administration of urinary antiseptics has not proved sufficiently beneficial to warrant their use in the treatment of gonorrhea. Of the dyes, the best known are pyridium and hexylresorcinol. The council of Pharmacy and Chemistry of the American Medical Association has recently concluded that the claims made for pyridium were not warranted. Other investigations<sup>6</sup> further support the conclusions that neither of these compounds has any bactericidal or bacteriostatic action upon the gonococcus.

Some of the older urinary sedatives, such as oil of sandalwood and copaiba are still widely used, not for their bactericidal effect upon gonococci, but for their proven anti-inflammatory action upon the urethral mucosa and for diminishing the spasm of the smooth muscles of the urethra. However, I do not employ balsamics routinely and do not consider them as indispensable.

In our attempt to find new lines of attack, hyperpyrexia, vaccines, serums, enzymes, foreign proteins, etc., were added to the gonococcal armamentarium with varied degree of success.

*Therapy by Heat.* Clinical evidence indicates that heat applied locally in almost any form has beneficial effect upon gonorrheal infection. The effect of heat, probably, is two fold, the non-specific one, increasing bodily resistance to the invading organism, and, a specific one, of killing or attenuating the gonococcus. However, the minimum degree of heat required for biologic destruction of the gonococci, in vitro, has not been definitely established. Different strains of gonococci are known to possess individual variations in their resistance to high temperatures. Recently Goldberg, Nikolaievskaia, Sheovindt,<sup>7</sup>

et al., have shown experimentally that the majority of strains of gonococci can withstand successfully temperature of 42 to 43C. (106.4 to 109.4F.), for a period of 6 to 8 hours, while the gonococci grown anaerobically have survived at the temperature of 45C. (113F.). Clinical significance of these laboratory findings is emphasized by the fact, that in the latent and chronic stages of gonorrhea, the gonococci are usually found in anaerobic states.<sup>8</sup> Various methods have been used in the attempt to kill the gonococcus by heat, principally in the treatment of women, inasmuch as they constitute a group in whom other methods of treatment are less satisfactory and in whom the tissues are less sensitive to heat than are those of the male urethra. Surgical diathermy and actual cautery have proven especially beneficial in the treatment of chronic gonorrheal endocervicitis, particularly when the destruction of tissue and the evacuation of cysts is desired.

Though a variety of special forms of heat appliances for various organs involved in gonorrhea has been devised and high pressure salesmanship methods on the part of manufacturers have turned the attention of the medical profession to this type of therapy, the results, in terms of cure, in a considerable series of cases of gonorrheal infection are still lacking, not convincing and inadequately controlled.

In eighty-five cases of gonorrheal epididymitis which I<sup>9</sup> have treated by local diathermy alone, there was an average of 16.2 sick days against eleven days for one hundred and twenty cases treated with the intra-epididymal injections of the patients' whole blood. It seems, that there is still much to be learned about the efficacy of local heat therapy in gonorrhea.

The same may be said about general hyperpyrexia in the treatment of this infection. In spite of enthusiastic reports from some quarters,<sup>10</sup> a careful perusal of the literature discloses a paucity of well controlled and checked series of clinical cases or authenticated evidence of the actual thermal destruction of gonococci and of their toxins in the tissues. Fever therapy may in time prove a boon to the gonorrhea patients, as it did to the paretics, but, for the present, we should reserve our enthusiasm.

**Vaccine Therapy.** In this country gonorrheal vaccines are credited by most specialists with very limited usefulness, usually only in chronic

and complicated cases. Undoubtedly, they are used less now than formerly. Both gonorrheal vaccines and serums were omitted from "The New and Non-Official Remedies," since in the opinion of the Council of Pharmacy and Chemistry of the A. M. A. there is not sufficient evidence of their therapeutic value.

As to the use of Corbus-Ferry filtrate in the treatment of acute gonorrhea, my personal experience is not conclusive, though in chronic cases, I believe it merits favorable consideration. The full evaluation of the non-specific proteins, enzymes, etc., in the treatment of gonorrhea should not be made at this time. My observation is that their chief field of usefulness, for the present, lies in the treatment of complications of this disease, particularly, epididymitis and eye lesions.

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#### DISCUSSION

Dr. H. J. Burstein, Decatur: Dr. Beilin is to be complimented on his straightforward presentation of the subject. The absence of a uniform type of treatment and the many innovations in therapy that are grasped as a possible new type of cure, only to be discarded after sufficient clinical trial, are ample evidence of the inadequacy of present methods in the treatment of gonorrhea.

While the newer vaccines and filtrates may have tremendous possibilities with further development, I do not feel that any of the now available products have attained any high degree of specificity in the cure of this condition. While the use of these preparations is rather widespread at this time, in my limited experience I feel that biologic therapy is of greatest benefit in certain chronic cases, and in these, must be given discriminately. Pelouze and Herrold have pointed out



the danger of overdosage, and undoubtedly many cases of chronic gonorrhea may be attributed to a lowering of the defensive mechanism by over zealous vaccine administration.

The use of artificial fever whereby the individual is subjected to a temperature of 106°-107° for from 4-6 hours at 3-4 day intervals should, in my opinion be reserved for cases with systemic complications, and especially when there is a complicating arthritis. This treatment unquestionably has a favorable influence on the disease in all stages, but should be reserved for such cases as have been mentioned and those refractive to the usual methods of local therapy. Artificial fever therapy is not without some element of danger, as deaths have been reported following intensive fever treatment.

In closing, just a few words about customary local treatment in acute gonorrhea. The local injection of antiseptics, using 3-5% mild silver proteinate, 1/8-1/4% strong silver proteinate in normal saline, or 1-4000 acriflavine solution is sufficient if done carefully once, and not more than twice daily. Too frequent injections or the use of stronger, irritating solutions have proven to be the source of many complications, especially in inducing posterior urethritis with its sequelae. Lastly, hyperacute inflammation calls for a prompt cessation of local treatment, bed rest, alkalization and sedatives, and in even the borderline severe cases, temporarily discontinuing all local treatment will lessen the incidence of serious complications.

## Society Proceedings

### COOK COUNTY

#### CHICAGO MEDICAL SOCIETY

Regular Meeting, Wednesday, December 2, 1936

#### PROGRAM

Allergy in Childhood.

I. Harrison Tumpeer.

The General Treatment of Allergy.

Harry Huber.

The Importance of the Recognition of the Minor Allergies.

Milton B. Cohen, Cleveland, Ohio.

Discussion opened by Frank L. Foran.

Regular Meeting, Wednesday, December 16, 1936

#### PROGRAM

Arthritis.

Laurence H. Mayers, M. D.

The Present Status of the Treatment of Arthritis.

Maurice F. Lautman, M. D.  
Hot Springs, Arkansas.

### GREENE COUNTY

Regular Meeting of the Greene County Medical Society held in Roodhouse, Friday, December 11, 1936.

The program consisted of a clinic conducted by our own members. Dr. H. W. Smith of Roodhouse presented a very interesting case of Parkinson's Disease in

a man of 20. A year ago this patient was entirely helpless, but has shown a very remarkable improvement under the atropine treatment, and is now able to go about ordinary work in a fairly satisfactory manner.

Dr. A. D. Wilson of Carrollton presented a patient who was suffering from sporotrichosis and called attention to the decided improvement under potassium iodide in liberal doses.

Dr. Bulger of Greenfield reported a case of osteosarcoma. These cases were thoroughly discussed by those present. Dr. T. B. Knox of Quincy, Illinois, Councilor of the Sixth District, gave us a practical talk on the economic side of the Doctor's work, with special reference to the medical care of the unemployed and indigent.

The membership voted in favor of the organization of a Women's Auxiliary to our County Medical Society.

Election of officers resulted as follows:

President, Dr. C. O. Bulger of Greenfield; Vice-President Dr. E. W. Thomas of Roodhouse; Secretary and Treasurer, Dr. Wm. H. Garrison of White Hall; Censor, Dr. Paul B. Bauer of White Hall.

It is worthy of note that every member of our society was present except one, a splendid record for any society. It is also worthy of note that the Greene County Medical Society is one of the 100% societies of the State, which is another commendable item and is proof that even though it is a small society (only fifteen members) it is wideawake and alert on matters that affect the welfare of the medical profession at large.

The next meeting will be held in Greenfield on Friday, January 22, 1937.

Wm. H. Garrison, Secretary.

### KANKAKEE COUNTY

On December 11 the physicians of the Kankakee County Medical Society celebrated the 45th anniversary of the society with a dinner at the Kankakee Country Club. Thirteen physicians in the county who have been in practice for over 40 years were given formal recognition. They are: Drs. U. A. Bedard, E. D. Bergeron, J. A. Brown, A. S. Eshbaugh, C. W. Geiger, J. A. Guertin, F. C. Hamilton, A. N. House and Dr. Phelps of Kankakee; Dr. J. V. Lewis of Mokena, Dr. G. W. Van Horn of Grant Park, Dr. S. R. Walker of Chebanse and Dr. W. A. Worstall of Aroma Park. Special recognition was given Dr. Van Horn who began practice 61 years ago and to Drs. Bergeron and Eshbaugh who have been practicing over 50 years.

Dr. S. R. Walker, Chebanse, was elected President, Dr. G. W. Morrow of the Kankakee State Hospital, Vice-President, Dr. E. G. Wilson, Kankakee, Censor and Dr. C. A. Perrodin, Kankakee, Secretary-Treasurer.

The principal address of the evening was by Dr. LeRoy H. Sloan of Chicago whose words, partly humorous, were on "Modern Docology." Dr. S. R. Walker, one of the original members of the society

told about the organization of the Kankakee County Medical Society in 1891. Dr. C. W. Geiger related his early experiences in the practice of medicine 40 years ago.

Yours very truly,  
C. A. Perrodin, Secretary.

### Marriages

THOMAS F. AHEARN JR., Chicago, to Miss Mary Doolin of Hammond, Ind., recently.

JOSEPH SLOAN BELL to Miss Elizabeth Webb Russell, both of Hoopston, Ill., in Chicago, December 3.

PETER A. ROST to Miss Gina Vanna, both of Chicago, recently.

### Personals

Dr. Julius H. Hess addressed the Englewood Branch on "Clinical Procedures in Pediatric Practice," December 1.

Dr. Percy Starr Pelouze, Philadelphia, among others, discussed gonorrhea before the Chicago Urological Society, November 19.

Dr. M. Herbert Barker, Chicago, discussed pneumonia before the Lee County Medical Society, November 16.

At a meeting of the Chicago Pathological Society, December 14, Dr. Edward L. Compere, among others, spoke on "Pathology of the Spine."

The McHenry County Medical Society was addressed, November 19, by Dr. Lester E. Bower, Chicago, on contagious diseases.

The Chicago Pediatric Society was addressed December 15, among others, by John Hays Bailey, Ph.D., on "Observations on the Epidemiology of Certain Streptococcal Diseases."

Dr. Leon Unger discussed the subject of "Allergy" at the meeting of the Maricopa County Medical Society, Phoenix, Arizona, on Monday, December 21, 1936.

Dr. J. P. Greenhill presented a paper on "Recent Progress in Obstetrics and Gynecology," December 15, before the Evansville Post Graduate group.

At a meeting of the Winnebago County Medical Society in Rockford, December 18, Dr. Edward L. Cornell, Chicago, spoke on "Newer Developments in Obstetrics."

### News Notes

Dr. Clark W. Finnerud, Chicago, addressed the DuPage County Medical Society in Naperville, November 18, on "Diagnosis and Treatment of Common Skin Diseases."

At a meeting of the Chicago Society of Internal Medicine, December 15, the speakers included Dr. Walter J. R. Camp on "Influence of Epinephrine on the Distribution of Potassium in the Body."

Dr. William P. Healy, New York, addressed the Chicago Gynecological Society, December 18, on "The Use of Radium and X-Rays in Gynecology."

A symposium on bronchiectasis was conducted before the Rock Island County Medical Society at Moline, November 10, by Drs. Paul H. Hollinger and Eugene T. McEnery, Chicago.

Dr. Heinrich Finkelstein, director, Municipal Children's Hospital, Berlin, Germany, addressed the Chicago Laryngological and Otological Society, December 7, on "Mastoiditis in Infants."

At a meeting of the Chicago Surgical Society, December 4, the speakers included Drs. Henry N. Harkins on "Mesenteric Thrombosis" and Harry E. Mock, "Certain Intra-Abdominal Lesions Simulating Malignancy."

At a meeting of the North Shore Branch, December 1, the speakers included Drs. Herbert A. Sacks on "Crisis in Addison's Disease Simulating Coronary Thrombosis" and Robert W. Keeton, "Problems in Malnutrition."

The Sangamon County Medical Society was addressed in Springfield, December 3, by Dr. Arthur Steindler, Iowa City, on "Low Back Pain: Contribution to Differential Diagnosis," and Hugh J. Graham, Jr., J.D., "The Social Security Act."

Dr. Howard K. Gray, Rochester, Minn., discussed "Surgery of Peptic Ulcer and Its Complications" before the Evanston Branch of the Chicago Medical Society, December 3, and Dr. Arthur R. Colwell, Evanston, Ill., "The Use of Protamine Insulin in the Treatment of Diabetes."

Dr. Merritt Paul Starr, Chicago, discussed "Endocrine Treatment Problems of the Adolescent Period" before the Will-Grundy County Medical Society at Joliet, November 25. At a meeting of the society, November 18, Dr. Eugene F. Traut, Chicago, spoke on arthritis.



A bronze plaque in the lobby of the Kane County Spring Brook Sanatorium, Aurora, was dedicated, December 6, to the memory of the late Dr. Imas P. Rice, superintendent, who died April 23. Dr. Rice, the first superintendent of the hospital, had held the position since March 10, 1921.

At a meeting of the North Side Branch, December 3, Dr. James B. Herrick read a paper entitled "Dr. Charles T. Parkes as I Knew Him," and Dr. Austin A. Hayden, "Biography of Charles T. Parkes." Drs. Frederick W. Madison and Theodore L. Squier, Milwaukee, discussed "The Role of Sensitivity to Drugs in the Production of Agranulocytosis."

At a meeting of the Adams County Medical Society in Quincy, November 9, Dr. Carl F. Vohs, St. Louis, discussed "Medical Security for the People by the Profession," and Mr. Ray F. McCarthy, St. Louis, "Interpreting Medical Leadership by the Profession."

Dr. Herman L. Kretschmer addressed the Highland Park Physicians' Club, Detroit, Michigan, on December 2nd. Subject: "The Treatment of Bladder-Neck Obstruction by Transurethral Resection."

Dr. Gatewood gave a talk before the North Central Illinois Medical Association at its annual meeting held December 1 at Streator, Illinois. His subject was "Lesions of the Ileum."

Dr. Herman L. Kretschmer was the speaker of the evening at the Annual Meeting and Frolic of St. Joseph County Medical Society, December 3, at Elkhart, Indiana. His subject was "A Doctor Looks at Europe," illustrated with lantern slides and moving pictures.

Dr. Philip A. Halper addressed the Annual Sight Saving Round Table State Meeting sponsored by the Illinois Society for the Prevention of Blindness on "What Every Sight Saving Teacher Should Know About the Diseases of the Eye." at the Palmer House, November 23, 1936.

Drs. Don C. Sutton and James T. Case will present papers on "The Old Myocardial Case with Reference to Treatment and Diagnosis," and "Some Phases of Colonic Diagnosis," before the Livingston County Medical Society at Pontiac, Illinois, the evening of December 17th.

Dr. Julius H. Hess attended the Georgia State Pediatric Society meeting at Atlanta, Ga., December 9th and 10th. He presented the follow-

ing papers: "The Present Status of Serum Therapy," and "Sinus and Teeth as a Source of Systemic Infection in Childhood."

Dr. Leo Gamburg, Senior Physician on the medical staff of the East Moline State Hospital for the past five years, resigned December first to enter the general practice of medicine and surgery in Moline, Illinois. He will also pay special attention to nervous and mental diseases.

Dr. Harold Swanberg, Quincy, Illinois, Editor of the Radiologic Review & Mississippi Valley Medical Journal, will address the Jefferson-Hamilton County Medical Society, at Hotel Emmerston in Mt. Vernon at 6:30 P. M., on January 11, and the Pulaski County Medical Society, at Hotel Halliday, Cairo, at 7:00 P. M., on January 29. Dr. Swanberg will give an illustrated lecture on "Radium Treatment of Benign Uterine Hemorrhage."

—The Illinois Association for the Crippled has been granted a charter and its first meeting was November 5. Paul H. Fesler, superintendent, Wesley Memorial Hospital, Chicago, is president, and Lola M. Armstrong, executive secretary.

—The second annual meeting of the members of the American College of Physicians of the state of Illinois, outside of Chicago, was recently addressed in Peoria by Drs. Allen K. Krause, Baltimore, on "Future Possibilities of the Diagnosis of Tuberculosis"; Horace W. Soper, St. Louis, "Clinical Significance of Milk and Cholesterol in the Dietary of Man," and Frank Smithies, Chicago, "Certain Ulcerative Lesions of the Bowel, Their Recognition and Management."

—The faculty of Rush Medical College recently voted to abolish the requirement of the fifth year for the degree of doctor of medicine, effective December 15. Certain additional provisions were made for students who have received the four year certificate since 1934 and who never received their degree because of illness and for students who received the certificate in the past year who were either not under contract to a hospital or whose contract could be altered by the hospital concerned to permit them to receive their degree before completing their internships.

—The Adams County Medical Society held a special meeting and dinner, November 24, to

honor Drs. Melinda C. K. Germann and J. W. Edward Bitter, who have completed fifty years in the practice of medicine in Quincy. Dr. J. Carl Steiner was toastmaster. Gold wrist watches were presented to both physicians. Speakers included Drs. Francis L. Reder, St. Louis, and Henry J. Jurgens, and three physicians who also have completed fifty years of practice: Drs. Levin H. A. Nickerson, Edmund B. Montgomery and William W. Williams. Dr. Germann graduated from the Quincy College of Medicine in 1886 and has been active in the civic life of the community. Dr. Bitter also graduated from the Quincy College of Medicine; he served two terms as president of the Adams County Medical Society in 1929 and 1933 and as secretary from 1922 to 1923.

—The present exhibit of the Chicago Medical Society in the Marshall Field and Company Annex Building is based on a recent report issued by the state department of health which showed that during the Christmas 1935 holidays the following cases in Illinois were in quarantine:

Smallpox .....	25	Scarlet fever .....	2,451
Typhoid .....	27		
Diphtheria .....	304		
Whooping cough .....	851	Total .....	3,622

The exhibit shows a child quarantined at home with scarlet fever, looking out at other children playing in the snow. Signs in the window say "This child was not protected" and a card by the children outdoors says "These children are protected; are yours?" A poster printed in red and green says "Christmas Gifts for Children Should Include Immunization Against Contagious Diseases."

—State commanders from ten Central Western states organized in the Women's Field Army of the American Society for the Control of Cancer met at the Chicago Woman's Club, November 30, to discuss plans for "enlistment week," March 21-27. "Early cancer is curable; fight it with knowledge" is the slogan of the field army, which seeks to enroll members for an enlistment fee of \$1. The money will be used to defray the expenses of disseminating information about cancer. It is hoped that this educational campaign will bring early cases to competent physicians for treatment. Speakers at the meeting included Mrs. Grace Morrison Poole, national adviser of the army; Dr. James P. Simonds, professor of pathology, Northwestern University School of

Medicine, and Dr. Frank L. Rector, Evanston, field representative of the American Society for the Control of Cancer. Commanders were present from Colorado, Indiana, Kansas, Kentucky, Illinois, Michigan, Minnesota, Nebraska, Wisconsin and South Dakota.

—The Illinois State Board of Registration in Medicine has been conducting a drive against illegal practitioners in Chicago and suburbs. Recently convicted was David Ingram, colored, who was given ninety days in the county jail. Ingram was involved in various swindles in Detroit, Waterbury, Conn., and Williamsport and Scranton, Pa. His aliases include the names William Hillis and Dr. William Hill. His claim to be a graduate of the National University of Argentina has been proved false. J. W. Keller pleaded guilty to practicing medicine without a license and was sentenced to eighty days in the county jail. Mrs. Ruth St. John pleaded guilty and was fined \$100 and costs; a dietitian, she said she prescribed diets only for her friends. Similar fines were imposed on Mrs. Burd Gray, Oak Park, self-styled "herbalist," and Ray Drangle, operator of the "Dra-So Health Center." Mrs. Valerie Klinger, a "practical psychologist," was found guilty of violating the medical practice act, fined \$100 and costs, and sentenced to thirty days in the county jail. Norman F. Allemeier was found guilty of practicing medicine without a license and fined \$250 and costs. He was sentenced to sixty days in jail but was placed on probation pending good behavior. Mr. John J. Halihan is director of the Illinois department of registration, and Mr. Homer J. Byrd, superintendent.

## Deaths

THEODOR WILLIAM BERTHOLD, Chicago; Northwestern University Medical School, Chicago, 1922; a Fellow, A. M. A.; on the staff of the Little Company of Mary Hospital, Evergreen Park, Ill.; aged 43; died suddenly, October 5.

CHARLES BLIM, Crete, Ill.; Rush Medical College, Chicago, 1888; member of the Illinois State Medical Society; formerly secretary of the southern Cook County branch of the Chicago Medical Society; for many years a member of the school board; aged 77; died, October 9.

HAROLD IVAN A. COOKE, Chicago; Medical Department of the University of Alabama, Mobile, 1904; aged 61; died, September 30, of chronic myocarditis.



GEORGE HENRY COWLES, Woodhull, Ill.; Rush Medical College, Chicago, 1896; aged 65; died, September 29, of coronary disease while driving his automobile, which went over an embankment into the lake.

HOWARD CRUTCHER, Joliet, Ill.; Chicago Homeopathic Medical College, 1885; aged 70; died, September 11.

VICTOR MACKAY DALY, Pontiac, Ill.; University of Edinburgh Faculty of Medicine, Scotland, 1892; served during the World War; on the staff of St. James Hospital; aged 69; died, October 22, of heart disease.

ALBERT EUGENE FUCHS, Bunker Hill, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1912; a Fellow, A. M. A.; formerly a practitioner in Chicago; aged 61; died, October 27, of diabetes mellitus.

HENRY J. GAHAGAN, Chicago; Rush Medical College, Chicago, 1893; a Fellow, A. M. A.; practiced in Elgin, Ill., from 1897 to 1914, where he served as commissioner of health from 1897 to 1901, and city physician from 1901 to 1909; member of the American Psychiatric Association, member of its National War Work committee, 1917-1918, and chairman of its occupational therapy committee in 1918 and 1921; member of the medical house staff, attending physician, Elgin State Hospital, from 1893 to 1897, and superintendent from 1914 to 1917; medical director of the Mercyville Sanitarium, Aurora, since 1917; attending physician, consultant on the staff and member of the insanity committee of the Cook County Psychopathic Hospital; in 1916 was appointed by the board of administration of Illinois to visit the state institutions in New York, Pennsylvania, Maryland, Massachusetts and Ohio and report as to the industrial pursuits of patients; aged 68; was killed, November 10, when he was struck by an automobile as he alighted from a bus.

FREDERICK HARVEY, Chicago; Chicago College of Medicine and Surgery, 1915; a Fellow, A. M. A.; fellow of the American College of Surgeons; served during the World War; member of the attending staff of the Grant Hospital; aged 46; was killed, December 9, in an automobile accident.

THEODORE CALVIN HAYS, Canton, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1889; at one time professor of gynecology and obstetrics at his alma mater; past president of the school board and formerly city physician; served during the World War; on the staff of the Graham and Murphy Hospital; aged 71; died September 21, of pneumonia.

AUGUSTUS JOHN LEITZBACH, Fairmount, Ill.; Bellevue Hospital Medical College, New York, 1887; a Fellow, A. M. A.; aged 74; died, September 26, in the Lake View Hospital, Danville, Ill., of carcinoma of the prostate.

FINIS COLEMAN LITTLE, East St. Louis, Ill.; St. Louis University School of Medicine, 1906; a Fellow, A. M. A.; during the World War served on a draft board; formerly member of the board of fire and police commissioners; aged 64; died, October 13, in the Christian Welfare Hospital, of arteriosclerosis.

WILLIAM ALFRED MANN, SR., Chicago; Chicago Medical College, 1883; assistant clinical professor of ophthalmology and otolaryngology at his alma mater,

1903 to 1906; past president of the Evanston branch of the Chicago Medical Society; oculist and aurist to the Michael Reese Hospital dispensary, 1890-1899, and the Provident Hospital, 1899-1910; aged 77; died, October 8, at his home in Wilmette, Ill., of carcinoma of the colon.

GEORGE ALBERT McLANE, Harvard, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; aged 60; died, October 2, of chronic nephritis.

HARRY COLLIER MIX, Oak Park, Ill.; Northwestern University Medical School, Chicago, 1909; served during the World War; aged 61; died, September 14, of cerebral hemorrhage.

JOHN HOWARD NEALL, Quincy, Ill.; Howard University College of Medicine, Washington, D. C., 1886; a Fellow, A. M. A.; aged 78; on the staff of Quincy Memorial Sanatorium, where he died October 13, of coronary occlusion.

ALFRED JAMES PARKER, Chicago; Chicago College of Medicine and Surgery, 1913; aged 62; died, October 6, of diabetes mellitus.

ELMORE SLOAN PETTYJOHN, Chicago; Rush Medical College, Chicago, 1882; aged 81; died, October 6 in Milford, Ohio.

JAMES THOMAS PICKERILL, Chicago; Northwestern University Medical School, Chicago, 1892; on the staff of the Swedish-Covenant Hospital; aged 71; died, October 14, of carcinoma of the submaxillary gland.

LEO ROBERT ROTH, Chicago; Illinois Medical College, Chicago, 1903; aged 56; died, September 22, in St. Anne's Hospital, of self-inflicted scalpel wounds.

CHARLES SCHOTT, Chicago; Rush Medical College, Chicago, 1909; a Fellow, A. M. A.; member of the American Academy of Pediatrics; served during the World War; on the staffs of the Illinois Masonic Hospital, St. Joseph's Hospital and the Children's Memorial Hospital; aged 51; died, October 1, of heart disease.

ELLIS SCHWIED, Chicago; Chicago College of Medicine and Surgery, 1914; on the staffs of the Mount Sinai Hospital and the Frances E. Willard Hospital; aged 46; died, November 27, of coronary thrombosis.

FRANK SEGEL SMITH, St. Peter, Ill.; Kentucky School of Medicine, Louisville, 1892; county coroner; aged 70; died, October 26, at Vandalia, of heart disease.

BORIS SOCOLOFF, Chicago; Loyola University School of Medicine, Chicago, 1919; aged 50; died, September 14, of heart disease.

CHARLES JOSEPH TIERNEY, Cicero, Ill.; Chicago College of Medicine and Surgery, 1915; a Fellow, A. M. A.; served during the World War; aged 48; on the staff of the Hospital of St. Anthony de Padua, Chicago, where he died, October 19, of coronary occlusion.

GEORGE A. WASH, Gibson City, Ill.; University of Louisville (Ky.) Medical Department, 1894; member of the Illinois State Medical Society; for ten years a member of the city board of health and board of education; past president and secretary of the Ford County Medical Society; member of the medical staffs of St. Joseph's and Mennonite hospitals, Bloomington; aged 68; died, September 21.

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\*Frazer, J. G.: *The Golden Bough*, vol. 1, New York, Macmillan & Co., 1923



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## BUYERS INDEX

### ABDOMINAL SUPPORTERS

Storm, Katherine L., M. D., 1701 Diamond St., Philadelphia, Pa. .... 31

### FOODS

Coca-Cola Co., Atlanta, Ga. ....  
 Corn Products Refining Co., New York City..... 4  
 R. B. Davis Co., Hoboken, N. J.....  
 H. J. Heinz, Pittsburgh..... 16  
 Mead Johnson & Co., Evansville, Ind..... 19  
 Nutritions, Inc., Beverly Hills, Cal..... 26  
 Ralston Purina Co., St. Louis, Mo..... 13  
 S. M. A. Corporation, Cleveland..... 2  
 The Wander Company, 180 N. Michigan Ave., Chicago.... 9

### FINANCIAL AND INSURANCE

Medical Protective Co., Fort Wayne, Ind..... 8  
 Physicians Casualty Co., Omaha, Neb..... 31

### HOSPITALS

Stokes Hospital, Louisville, Ky..... 30

### PHARMACEUTICALS

American Can Co., 230 Park Ave., New York City..... 3  
 Armour & Co., Chicago.....  
 Bovine Company, Chicago..... 20  
 Bristol-Myers Co., New York..... 23  
 Carnrick, G. W., Co., 411 Canal St., New York City..... 17  
 Crookes Laboratories, Inc., 305 E. 45th St., New York....  
 Ciba Company, Cedar and Washington St., New York City..  
 Denver Chemical Co..... 24  
 Gold Pharmacal Co., New York City..... 81  
 Harrower Laboratory ..... 32  
 Hoffman-LaRoche, Inc., Nutley, N. J..... 7  
 Hyson, Westcott & Dunning, Charles and Chase Sts., Baltimore ..... 11  
 Lilly, Eli & Co., Indianapolis, Ind..... 18  
 Merck & Co., Rahway, N. J..... 14  
 Wm. S. Merrell Co., Cincinnati.....  
 Morris, Phillip, & Co., 19 Fifth Ave., New York..... 8

Numotizine, 900 N. Franklin St., Chicago..... 23  
 Parke, Davis & Co., Detroit, Mich..... 5  
 Petrolagar Laboratories, 8134 McCormick Blvd., Chicago...  
 Rare Chemicals, Nepera Park, N. Y.....  
 Reed & Carnrick, Jersey City, N. J..... 29  
 Scheuing & Glatz, Inc., New York City..... 22  
 G. D. Searle & Co., 4737 Ravenswood Ave., Chicago..... 6  
 Sharp & Dohme, 41 John St., New York City..... 17  
 E. R. Squibb & Sons, New York..... 35  
 Frederick Stearns & Co.....  
 Tilden Company, New Lebanon, N. Y..... 27  
 Wm. R. Warner & Co., 113 W. 18th St., New York City.. 10  
 Williams & Co., 4554 Broadway, Chicago..... 30  
 Winthrop Chemical Co., 170 Varick St., New York City.... 12

### SANATORIA AND SANITARIA

Edward Sanatorium. Naperville, Ill..... 27  
 Elmlawn (Wilgas) Sanatorium, Rockford, Ill..... 25  
 Kenilworth Sanitarium, Kenilworth, Ill..... 25  
 Michell Farm Sanitarium, Peoria, Ill..... 36  
 Milwaukee Sanitarium, Wauwatosa, Wis..... Front Cover  
 Norbury Sanitarium, Jacksonville, Ill..... 25  
 North Shore Health Resort, Winnetka, Ill..... 36  
 Rogers Memorial Sanitarium, Oconomowoc, Wis..... 36  
 Waukesha Springs Sanitarium, Waukesha, Wis..... 25  
 Weirick's Sanitarium, Elgin, Ill..... 30

### RADIUM

Physicians Radium Assn., 55 E. Washington St., Chicago.. 31  
 Radium and Radon Corp., 25 E. Washington St., Chicago.. 33

### SCHOOLS

Pogue School, Wheaton, Ill.....

### SURGERY INSTRUCTION

A. V. Partipilo, M. D., 1950 S. Ogden Ave..... 26

### SURGICAL SUPPLIES

W. A. Baum Co., New York..... 26  
 General Electric X-ray Corp., 2012 Jackson Blvd., Chicago. 15  
 Oxinjector, Inc., 333 N. Michigan Ave., Chicago..... 30



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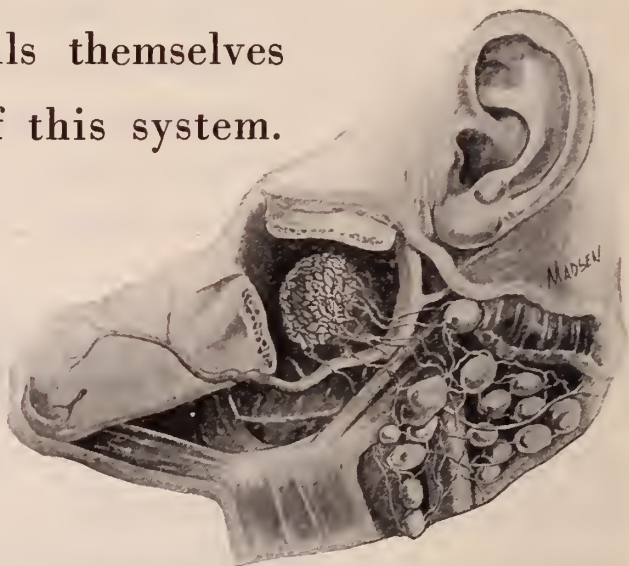


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### ENDOCRINE FACTORS IN STERILITY

Richard Chute, Boston (Journal A. M. A., Dec. 5, 1936), is of the opinion that much of the treatment of endocrine sterility in the past has been unsuccessful owing partly to the indiscriminate use of miscellaneous gland therapy, based on vague hopes rather than on science. Clinically there are three glands, the hypofunctioning of which are mainly responsible for most endocrine sterilities—the anterior pituitary most frequently, then the ovary and the thyroid. In dealing with sterility of probable endocrine origin, it is of fundamental importance to find out by means of both clinical and laboratory observations, including biologic hormone tests, which gland is primarily responsible, in order to give the proper treatment intelligently and effectively. The

therapeutic injection of gonad substance not only does not stimulate the gonads but injures them and is contraindicated in sterility. At the present time the simultaneous administration of both pituitary gonadotropic principles would seem to be the best form of therapy in cases of gonadal hypofunction which have been shown to be secondary to failure of the anterior pituitary. Thyroid extract is a very valuable aid to the treatment of sterility. Since nothing can be done for sterile adults with markedly and completely hypoplastic testes and ovaries, it is desirable for adolescents who present any endocrine symptoms such as delayed appearance of the catamenia, to consult a physician and have treatment before it is too late and the developmental impulse is exhausted.





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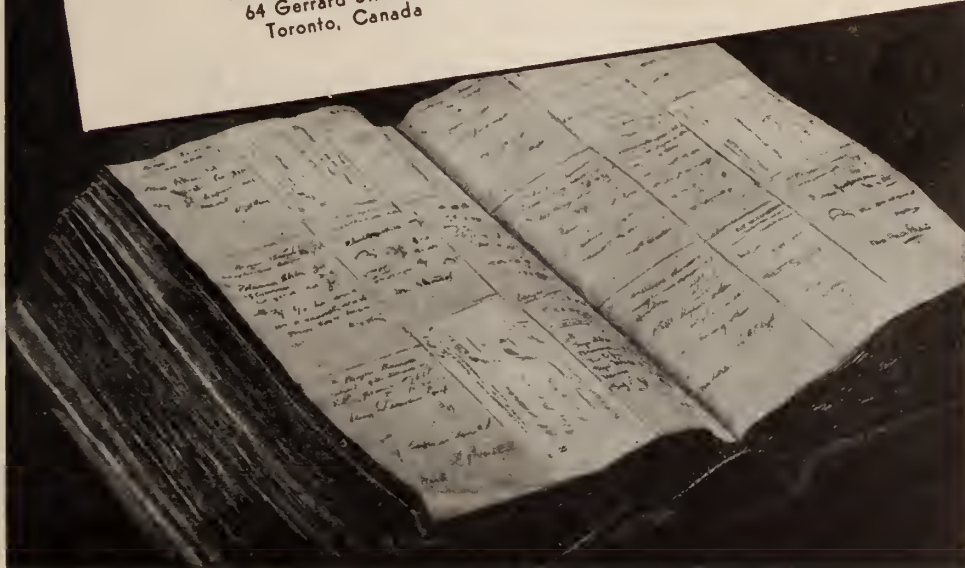
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## Book Reviews

**A TEXT BOOK OF MEDICINE.** By Charles Phillips Emerson, M. D. Philadelphia, London, Montreal. J. B. Lippincott, 1936. Price \$8.00.

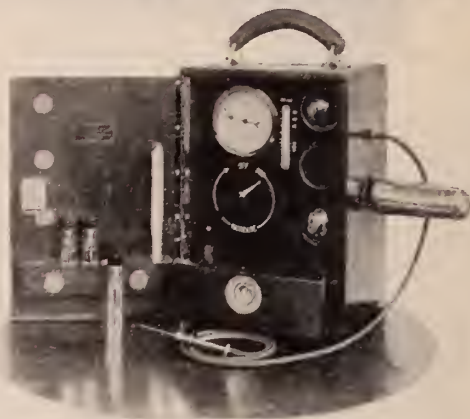
In this work the author has presented internal medicine in terms of the clinical pictures of diseases, and explains these by the findings of pathology, biochemistry, and the other preclinical sciences, rather than to emphasize the latter, mentioning symptoms as logical consequences of disturbances in these fields. The author has portrayed clearly the syndrome which each disease presents, and lest they blur this, have added a contribution of the pre-clinical sciences in special paragraphs and footnotes.

**INTERNATIONAL CLINICS.** A quarterly of illustrated clinical lectures and especially prepared original articles on medicine, surgery and the entire list of specialties by leading members of the medical profession throughout the world. Edited by Louis Hamman, M. D. Volume VI. Forty-seventh Series, 1936. Philadelphia, Montreal, London. J. B. Lippincott Company.

**DISEASES OF THE CORONARY ARTERIES AND CARDIAC PAIN.** Edited by Robert L. Levy, M. D. New York. The MacMillan Company. 1936. Price \$6.00.

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**PLASTIC SURGERY OF THE NOSE.** By J. Eastman Sheehan. Second edition entirely rewritten. With 131 text illustrations, including seven in color and fourteen full page plates consisting of one hundred and four photographs. New York, London. 1936. Paul B. Hoeber, Inc. Price \$9.00.

This book is a revision of plastic surgery of the nose, published in 1925. The classification of nasal disfigurement made in that book stands, but whereas the corrective operations then described were addressed mostly to separate discrepancies, in this book recognition is given to the fact that where there is one deviation from the ideal anatomy there are almost always two or more. The intervention procedures being governed, in practice, by this circumstance, it has been thought desirable to indicate, in several instances, the actual clinical experience as related to these combinations, which account for practically every variation presented in the course of operation for correction of nasal disfigurement.

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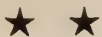
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## Book Reviews

**APPLIED DIETETICS FOR ADULTS AND CHILDREN IN HEALTH AND DISEASE.** By Sanford Blum, M. D. Philadelphia. F. A. Davis Company. 1936. Price, \$4.75.

In recent years great advances have been made in vitaminology. In this work a comprehensive review of the nature and functions of the vitamins is presented. The practical application of the vitamins in the treatment of deficiency diseases is discussed in detail. Adequate consideration has been given to the dietetic importance of essential chemical elements not usually present in organic compounds and frequently referred to in medical literature as inorganic elements. There is a timely chapter entitled "Dietetic Fads and Fallacies."

**CONQUEST OF GOITER.** By Emilian O. Houda, M. D. Tacoma, Washington. The Conrad Printing Company. 1936. Price \$2.50.

The author's ideas of goiter are new and at variance with the usually accepted theory as to the cause of this disease. Many authors attributed the condition to a deficiency of iodine in the diet. Dr. Houda on the other hand, claims that the role of iodine in goiter is secondary and that the cause is an infection.

**PRINCIPLES OF BIOCHEMISTRY.** By Albert P. Mathews, Ph.D. Baltimore. William Wood & Company. 1936. Price \$4.50.

Not a revision or condensation of the author's long-famous standard Textbook of Physiological Chemistry, but a completely new work. A concise, thoroughly modern and up-to-date presentation for colleges where the course is too short to use the larger textbook. Written clearly, with sympathy for and understanding of student's difficulties based on 40 years of teaching.

**CARDIOVASCULAR DISEASE. A NEW ASPECT OF CAUSE AND TREATMENT.** Dubuque, Iowa. J. H. Schrup, M. D. 1936. Price 12 cents.

**A TEXTBOOK OF OBSTETRICS:** By Edward A. Schumann, A. B., M. D., F. A. C. S., Professor of Obstetrics, School of Medicine, University of Pennsylvania; Surgeon-in-Chief, Kensington Hospital for Women; Gynecologist and Obstetrician to Philadelphia General and Memorial Hospitals; Obstetrician to Chestnut Hill Hospital; Consulting Gynecologist to Frankford, Jewish, Burlington County and Rush Hospitals. 780 pages with 581 illustrations on 497 figures. Philadelphia and London: W. B. Saunders Company. 1936. Cloth, \$6.50 net.

This work is intended primarily for students and practitioners. The author presents the arts and science of obstetrics as it is regarded at the present time. The mechanics of childbirth, and its more common complications, while the more rare conditions are but briefly sketched. Unproved theories are simply mentioned, but no attempt has been made to avoid controversial topics.

**MEDICAL CLASSICS.** Compiled by Emmerson Crosby Kelly, M. D. Vol. 1, No. 1. Baltimore, Md. The Williams & Wilkins Company.

Medical Classics while published periodically is a book rather than a typical journal. The content is not a matter of merely antiquarian or historical interest, but a contribution of the practice of medicine.

**THE PRACTICE OF MEDICINE.** By Jonathan Campbell Meakins, M. D. With 505 illustrations including 35 in colors. The C. V. Mosby Company. St. Louis. 1936. Price, \$10.00.

This work is not intended for the specialists, nor does it inspire to be an encyclopedic, but rather for the student and practitioner, to assist them in solving the numerous puzzles and problems with which they are daily confronted. The work is very timely and brings the subject of medical practice up-to-date in a concise and readable manner.

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## CONTENTS:

Editorials (For Titles See Extended Table of Contents) ..... 93

### ORIGINAL ARTICLES

Reducing Infant Mortality. *Henry C. Niblack, M. D., Chicago*..... 109

Poisoning, Diagnosis and Treatment. *Wm. D. McNally, M. D., Chicago*..... 115

Electrocardiography. *B. S. Kleinman, M. D., Chicago* ..... 127

Venereal Disease Situation. *Frank J. Jirka, M. D., Springfield, Ill.* ..... 130

Ephedrine, Oral Administration re Common Cold. *G. Howard Gowen, M. D., and Alexander J. Nedzel, M. D., Chicago*..... 132

Physical Therapy re Eye, Ear, Nose and Throat. *John S. Coulter, M. D., Chicago*..... 136

Aspirin and Aspirin with Calcium re Arthritis. *A. M. Serby, M. D., and S. Sideman, M. D., Chicago* ..... 140

Occupational Disease Problems. *C. O. Sappington, M. D., Chicago*..... 143

Senile Cataract Incision, Accidents and Errors. *Watson W. Gailey, M. D., Bloomington, Ill.*... 150

Chronic Prostatitis, 1000 Cases. *Herman L. Kretschmer, M. D., H. A. Berkey, M. D., Norris J. Heckel, M. D., E. A. Ockuly, M. D., Chicago* 152

Infectious Mononucleosis. *Harry J. Isaacs, M. D., Chicago* ..... 161

(Continued on page 8)

Eighty-Seventh Annual Meeting, at Peoria, May 18, 19, 20, 1937

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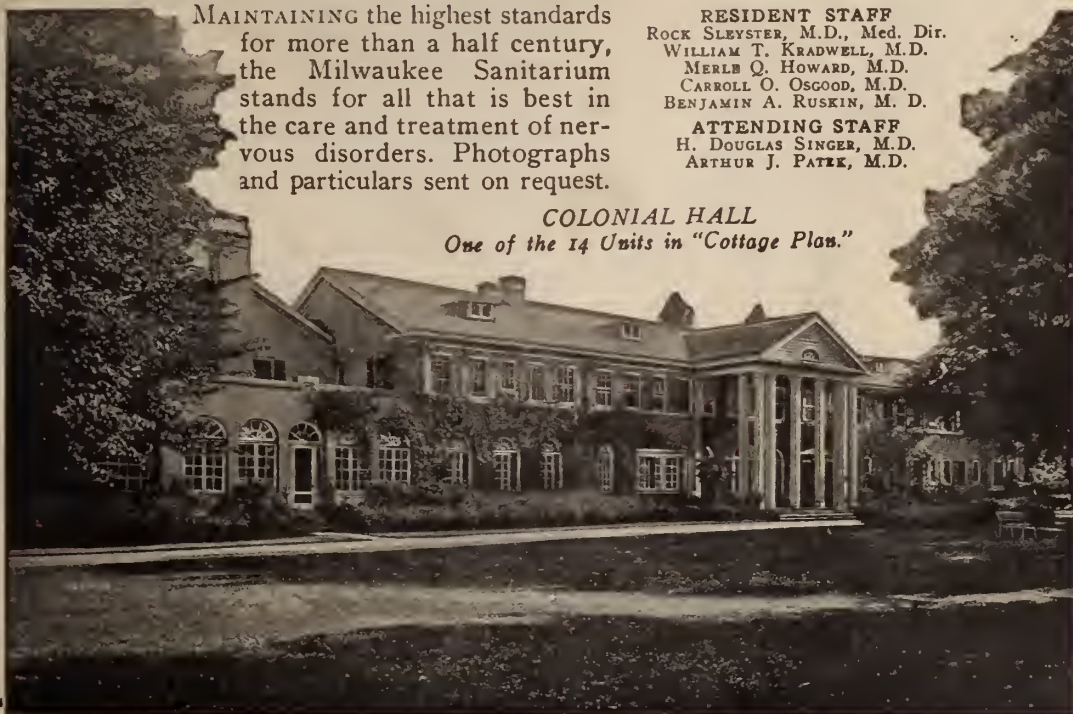
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It has been shown that spinach slowly loses its vitamin C potency even in low temperature storage; at room temperature, one-half of the vitamin C is lost in three days; practically all antiscorbutic potency disappears in seven days (1).

Another report indicates a loss in vitamin C of 78 per cent in spinach stored two days at room temperature and 80 per cent loss in asparagus tips during four days' storage (2).

The vitamin C content of apples is markedly reduced during cold storage: 20 per cent in 4 to 6 months and about 40 per cent in 8 to 10 months (3).

Vitamin A in apples is, however, subject to less destruction than vitamin C during prolonged storage (4).

Prolonged cold storage of pears may result in a loss in the vitamin A and vitamin C content of nearly 50 per cent (5).

Further, solution losses which may occur during cooking vary with the individual product and with the method used in cooking. From 40 to 48 per cent of vitamin C may be lost to the water in which peas are cooked (6).

Vitamin C losses in 12 different vegetables have been reported to vary from 12 per cent in asparagus to 80 per cent in white onions (7).

These data demonstrate the seriousness of solution losses of vitamin C. It is considered probable that other water soluble vitamins are affected in a similar way.

Thus, by the time fruits and vegetables spend some days in transit or storage before reaching the kitchen and are cooked by the usual home method, much of the original vitamin content may have been lost. Little can be done to prevent storage losses when fresh fruits and vegetables are not available from the home garden, but solution losses may in part be overcome by using the cooking water.

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(1) 1936. Food Research I, 1.  
(2) 1936. J. Soc. Chem. Ind. 55, 153T.  
(3) 1933. J. Agr. Res. 46, 1039.

(4) 1936. Food Research I, 121.  
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b. 1928. Ind. Eng. Chem. 20, 202  
c. 1929. Ibid. 21, 347  
d. 1932. J. Home Econ. 24, 826

*This is the twenty-first in a series of monthly articles, which will summarize, for your convenience, the conclusions about canned foods which authorities in nutritional research have reached. We want to make this series valuable to you, and so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles.*



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References: Kugelmass, Clinical Nutrition in Infancy and Childhood, Lippincott; Marriott, Infant Nutrition, Mosby; McClean & Fales, Scientific Feeding in Infancy, Lea & Febiger.

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## CONTENTS—Continued

### ORIGINAL ARTICLES

Women as Slaves to Industry. John R. Harger, M. D., Chicago .....	165
Problems in Mechanical and Laboratory Aids to Diagnosis. George Parker, M. D., Peoria, Ill. ....	169
Jelly Belly (Pseudomyxoma Peritonei). Walter W. Voigt, M. D., Chicago .....	172
Suppurative Otitis Media. Treatment with Iodine Powder. Carl H. Christoph, M. D., Chicago .....	176
Appendicitis Is an Emergency. Golder Lewis McWhorter, M. D., Chicago .....	179

### EDITORIALS

Withholds Approval .....	93
Every Safeguard .....	94
Layman Public Interest .....	95
Why Am I a Doctor? .....	96
Consistency a Jewel .....	97
Actuary re Lay Control .....	98
Bring a New Member .....	98
Chicago Offers Protection .....	99
Doctor Writes History .....	99
Section of Obstetrics .....	99
Eye, Ear, Nose and Throat .....	99
Woman's Cancer Army .....	100
Medical Economics. E. S. Hamilton .....	101
Group Hospitalization. C. E. Wilkinson .....	102

### CORRESPONDENCE

Smallpox. Frank J. Jirka .....	105
Dr. Braunwarth. Thomas P. Foley .....	106
Educational Committee .....	106
Woman's Auxiliary .....	107
Northwest Medical Conference .....	107
California Increases Dues .....	108
Armour Ligatures .....	108
Hospitals Speak .....	108
Midwest Conference .....	108

### SOCIETY PROCEEDINGS

Cook County-Chicago Medical Society .....	181
Hancock County .....	181
Personals .....	181
News Notes .....	183
Deaths .....	184

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Arch. Otolaryngology, Mar. 1936, Vol. 23, No. 3, 306-309

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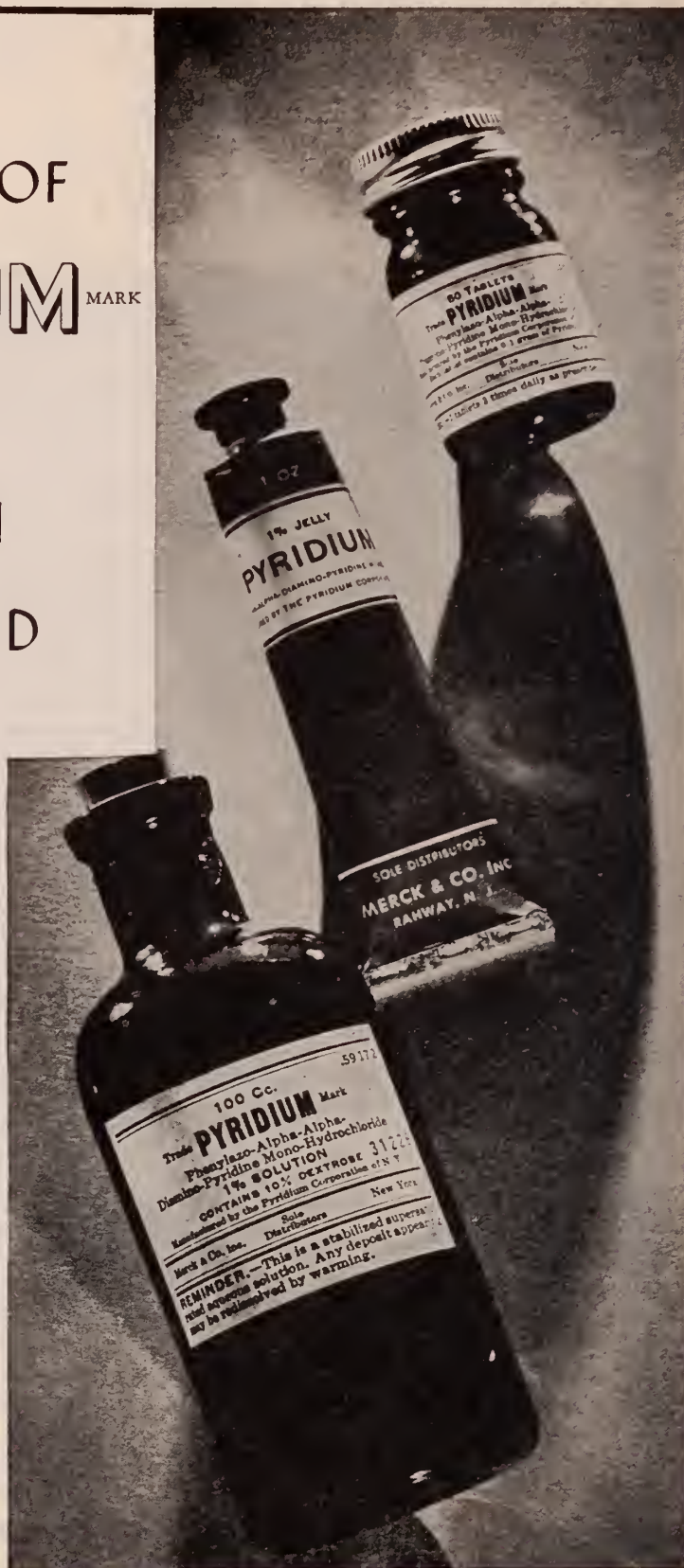
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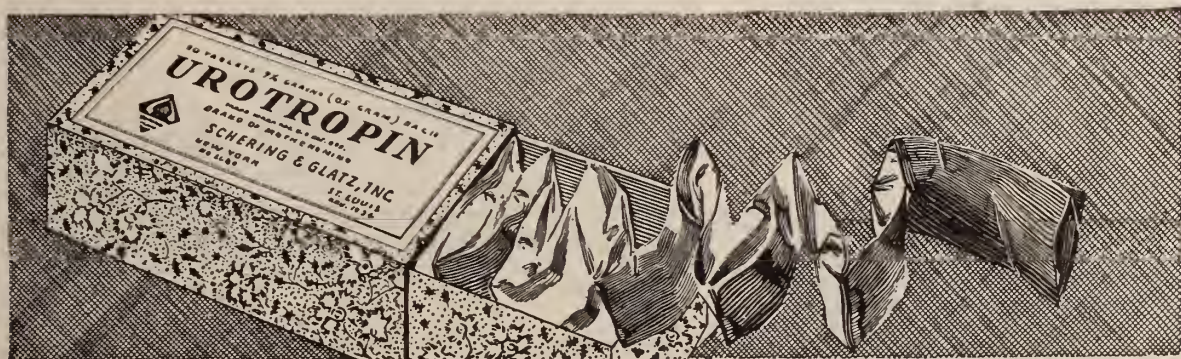
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## Editorials

### WITHHOLDS APPROVAL OF GROUP HOSPITALIZATION UNTIL AT LEAST FIFTY-ONE PER CENT. OF DIRECTORS OF PROJECT ARE MEMBERS OF THE CHICAGO MEDICAL SOCIETY

Negotiations conducted by the Group Hospitalization Branch of the Chicago Hospital Service Corporation remain unconsummated.

The Chicago Medical Society Council based its refusal along the following lines:

A number of potential evils in the proposed plan must be mentioned, considered and guarded against.

The main idea to be retained by the medical profession is that the fundamental principle of all medical practice is that any activities for which medical men and their professional services form the nucleus *must remain under the control and decisive direction of medical men.*

Otherwise the profession and all its works will falter and die under the inadequate perspective of lay control.

The development of Group Hospitalization deeply concerns the proper control of professional activities as well as the public welfare. To the professional and experienced eye the two are one and the same since public welfare suffers under lay-controlled medicine.

Under the existing set-up of the Group involved, this present Hospitalization Group offers to medical men the representation of *seven* directors out of *fifteen*, of which, while two may be nominated by The Chicago Medical Society, *three* may be nominated by the affiliated hospitals and *two* more will be representing the administration. The picture is plain. Medicine may not wear blinders under those conditions but it certainly will appear in at least one handcuff and a ball and chain. But it is for the Council to decide whether this number is adequate. The Council confronts three paths; to approve the ordained arrangement; to disapprove it; or to table the matter for future action.



In view of the various conditions which have been set forth and to bring the affair to a final issue it is recommended that official approval of Group Hospitalization shall be withheld until at least fifty one per cent. of the directors of the project are restricted to members of the Chicago Medical Society. *Medical matters must be managed by medical men.*

Imminence of interference in the practice of medicine by political bureaus and lay-theorists working under government labels should evoke from the profession greater caution in avoiding uncertain or questionable or dubious entanglements.

Though the present Directorate of this Hospitalization Group is probably altruistic and inclined to maintain present policies, through Fate, fatigue, or resignation the personnel of this board may be expected to change within a few years. Such changes cannot help but be followed by alterations of method or purpose or both, and those changes may fall short of medical ideals. Those things have been known to occur. Frequently the sincerest altruism of a self-perpetuating body may develop into vastly different motives or sink into tyrannical self-indulgences.

Nor is there any safeguard but that possibly under some future management and in the thirst for expansion the hospitals may not only regret their present attitude but entertain seriously the thought that the hospital has a right to present medical care as well as hospitalization.

Doctors should remember that it is much easier to abdicate a throne than it is to regain it. A throne given up to those who are untrained in the use of its functions and powers is a crime against its subjects.

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### EVERY SAFEGUARD SHOULD BE THROWN AROUND GROUP HOSPITAL INSURANCE SETUP

Partisans for plans of Group Hospitalization, acting in all good faith, must evade the danger of setting up an apparatus that may function only as an additional gadget in the cause of compulsory health insurance and state medicine.

One of the possible hazards of Group Hospitalization is that not illogically the hospitals may be presumed to be receptive to the idea of assuming prerogatives far beyond their legitimate, scientific scope. Physicians throughout

the United States have already become familiar with the sad spectacle of an alma mater competing professionally with its alumni in the practice of medicine. More parallel than analogous would be the sight of hospitals in group hospitalization units offering under the scope of the group hospitalization insurance plan, not only hospitalization but x-ray and other laboratory facilities and, eventually, even medical service itself.

Hospitalization makes its greatest play by being financially attractive to the laity, since the requisite ten or twelve dollars per annum is anything but onerous to any employed person, no matter how low his income, when it insures him for a year's hospitalization, should that need arise, and prepaid hospitalization at that. The initial argument for group hospitalization was that it would take care of the hospital and leave the patient free to take care of the doctor.

Investigation and appraisal turn up the fact however that this last statement needs to be taken with more than the traditional grain of salt. It raises, too, the query as to how much the hospital ultimately will take on its own shoulders and how much it will leave for medicine of the rights that belong to medicine! Surgery, obstetrics, clinical laboratories, x-ray, and laboratory specialties are all distant green pastures that shine before the eyes of the lay boards and directorates that control hospitals most generally throughout the United States. It is a scientific precept that *medical men should control all things and affairs that are medical*. The one way in which Group Hospitalization can be of use in the unit of public health and welfare is for the entire plan to be under the control of medical men. It will never do for the patient and the hospital, the lay-directed, endowed, managed and controlled hospital, to enter into any arrangement in which the physician is not only a negotiating but also a controlling factor. The insured and the insuring groups have been well-informed as to the details and ideas of this mutual pact, but there is a possibility that the doctor as an individual and the profession as a whole may find themselves on the outside looking in, instead of in the inside looking out, through their own failure to provide for the control.

And, in a quick review of the whole idea, what provision has been made in this scheme of Group Hospitalization for the indigent or the unemployed? That there is none would indi-

cate that the answer might be obvious to the eye and loud to the ear. The individual private practitioner will be as always responsible for the poor.

Therefore, as previously stated, the profession must be alert to the danger of endorsing projects which may in all seriousness fit in towards compulsory health insurance.

### LAYMAN PUBLIC INTEREST IN MEDICAL COST IS PERHAPS MORE POLITICAL THAN HUMANITARIAN

Medical care, its cost and its administration, has suddenly become almost as burning a topic in legislative halls as was once the abolition of slavery, or the repeal of prohibition, or the granting of franchise to women.

Which would be gratifying beyond words to the medical profession were it not that this sudden interest in "Medical Care" does not arise from any desire for better medical care, either from an humanitarian or a scientific standpoint; nor from an actual equalization of opportunities for medical care,—though this is the fetish under which the crusade is being waged,—; nor from any yearning to better the slaves of this exacting science,—i. e., ethical medical men, though their post-war state is indubitably crying aloud in a deaf-cared wilderness for alleviation,—but rather because medical care, its costs and its ramifications have become one of the burning *political interests of the day*. To see the science dealing with public health and welfare, and, *per sequitur*, with national prowess and supremacy and wealth, become the pawn of politics, is the dread vista that this twentieth century has presented to the physicians of the world.

Germany, Great Britain and France are already in the toils of a medical profession sacrificed to the Juggernaut of unbridled, undisciplined, uninformed, rutherless, selfish, political jobbery. Its encroachment upon the scientific purity of American ideals, both of nationalism and of medicine, is a most deplorable disaster,—in fact, a terrible tragedy.

Three of the major continental powers, Germany, France and Great Britain, stagger under the burden of "State medicine," which is the goal towards which all this propagandizement of "medical care" is headed. And the whisper grows louder daily, and that to the dismay of every perspicacious physician, that "State Medi-

cine," mask it as you will, is *far from being "Anathema" in the seats of the mighty of America.*

And "*That way madness lies.*"

State medicine is one of the corner stones of communism. It is the substitution of "*The State*" for *Science*. And is by the very virtue of that substitution, gross robbery of the most precious possessions of that very State it smirks seemingly to serve.

"What is 'State Medicine'?" the layman asks and the query,—sad truth it be to admit—comes often from the very men who should be out and aboveboard fighting this monster at the gates.

Briefly, State Medicine is a scheme, by which every man, rich or poor, is over-taxed to under-pay and to under-mine the very profession upon which depends the health and welfare, and hence the wealth and prosperity of the nation.

Begotten as a Bismarckian sop to the enslaved laborers in the Prussian mines over a half century ago, like all latent evil, this State Medicine has caught the trick of false bedizenment through will-o-the-wisp promises to beguile the theorists and dreamers of the world. Struck from the flint of a false hypothesis, the sophistries of "State Medicine" seem well on the way to set fire to the smoldering revolts of the world.

Setting aside the fact that the doctor fares so ill that he is sandbagged before the system of State Medicine is well begun, the truth remains that the people are taxed and retaxed to pay for a partial service from which they receive a sad fragment of return. As the Tahitian savage trades a magnificent pearl for a dime store mirror and three yards of pink calico, so under every system of State Medicine as yet devised the taxpayer swaps his purse for a mushroom promise and phantom service.

"Caveat emptor!" In "State Medicine" truly the purchaser pays and should beware. Survey of the results of "State Medicine" in those countries where this perverted form of medical attention rules, is enough to appal any honest mind.

Chiefly its sourest fruits would seem to be:—

1. Lowered morale on the part of the profession:
2. Inadequate service towards the clientele due to bureaucratic redtape, inadequate recompense and inadequate study and diagnosis of individual cases eventuating from a mass clientele:
3. Too much lay control of scientific practice:



4. Too political and too unscientific a control:  
 5. Too much taxation for results to taxpayers:  
 6. Government interference with affairs of nature too involved to be regimented under human mechanistics:

7. Development of a group of "*Malades imaginaires*" or of malingering citizens who find it more profitable to ail at the expense of the state than to follow the normal lines of industry:

8. NO REDUCTION IN DEATH NOR INCREASE IN BIRTH RATE.

9. Analagous ethical debauchery of the apothecaries and loss of profit to them as well as to dentists.

10. General chaos of method and confusion of ideals with no profit except to uninformed lay supervisors and inspectors.

The Physicians of the United States will do well in the coming year to tudy this question both from the point of the profession and the public but also of the public pocketbook which is after all, only the health and wealth of the nation.

State Medicine is the boldest brigand yet loosed to rob the world of a service as fundamental as life itself.

### WHY AM I A DOCTOR?

Legislatures and general assemblies are in session all over the land. Under many a legislative roof the statutes are being saturated with socialistic poison. Lest the medical profession should feel that it has a right to ignore what the lawmakers are doing with complete disregard to the safety of both their rights as doctors and their rights as men it may be well to persue the following excerpts made recently by Floyd S. Winslow, M. D., President of the Medical Society of the State of New York, at the eighth district branch of the medical society of the State of New York at Buffalo, October 15, 1936, upon the topic "Why Am I a Doctor?"

"Once in a while, it will be good for us doctors to indulge in what might be called a 'periodic self-examination.'

"Certainly we are not doctors because of the money that is in it. Generally speaking, our companions of early years who selected business pursuits have outstripped us in gathering together the collection of objects which represents monetary success. *Why* did we go into medicine? *Why* do we stay in medicine? *Why* do we live

for, *fight* for, and sometimes *die* for medicine?

"Glory? Where is the romance in our pursuit, for those who follow it? It is said that every ship is a romantic object save the ship we are sailing in, and medicine has romance for those who do not practice it. We work in the quiet of the sick room, or the hospital; we walk daily with troubled humanity. Our satisfaction can derive only from the knowledge that we have performed our obligation to heal the sick,—in this way paying the debt we owe for that accumulated knowledge and experience of the ages which has been made available to us.

"The great majority of doctors is imbued with the purpose to discharge this obligation. The public should be definitely told, that the most important thing it should inquire about, when selecting a doctor, is whether he is genuinely interested in his calling, loves his profession and is not only intent to attain ability as a physician but feels a responsibility to advance the capacities of the medical profession as a whole. This is, as you know, the main ideal and objective of medical societies. The man who has such a goal as this in mind as a destiny, is a man who can be fully trusted with the lives of men, and women and children. Let ue see how this works out.

"The test of this criterion is, in other words, a test of character. A man joins his county medical society. He considers that when he was given the right to practice medicine, he assumed an obligation to do his part to see that medicine, as a profession, preserved its integrity. The only way integrity can be attained or retained, is to work for it. When he joins his local medical society he works for the integrity of himself and his group. He renders himself open to the criticism of his peers. He says, in effect, 'I intend to behave myself, to put the interest of my patient above my own, to observe all the other provisions of the oath of Hippocrates, in letter and in spirit. And not only do I intend to do this, but by joining the county medical society *I have to do it*—I lay myself open to penalties if I do not.'

"The public should be told that a doctor who is a member of his county medical society is a better doctor on this account. I think a patient should ask his doctor, if he is not a member of the medical society, why he is not a member. It is possible, of course, that a physician may be of the highest rank, and not be a member, there is nothing compulsory about it, but as I go over in

my mind the names of the physicians who I find have lived so that their excellence is beyond possible question, *I do not think I can name one who is not a member of his county medical society.*

"Now if our loyalty to our profession is merely another form of loyalty to society—to mankind—a point comes up which I wish now to mention. The world today is facing deep and important problems. Confusion abides in the minds of men. Quacks are abroad plying their trade in the realm of *economics* and *sociology* as well as in that of *medicine*. Large groups of people are assuming to know that which they do not know. They are contemptuous of the experience of the past, and of the experience of individuals; they decry special skills; they substitute rhetoric for reason. So we have *another obligation, just as basic as the medical obligation*, and that is a *social obligation*. We must reach out and interest ourselves in these questions which are quite outside medicine, but which need a generous skepticism to counteract what often seems to be a pathological optimism. We have not repaid our debt to society when we merely heal the sick. *In some respects, the well need healing, too.* That is to say, if we are not to have all our values, and all our superiorities broken down. 'One man,' Mr. Dooley said, 'is not only as good as another, but a damned sight better.' There are no experts left. There are only simplifiers. And what are we doing about it?

This is not a matter of partisan party lines: the same kind of thinking is to be found everywhere. The public is coming to believe that it is capable of exercising its opinion, its judgment, on difficult technical problems, with no knowledge, no experience. Further than this the public expresses that opinion in response to a catchword. In fact the general public does not even make the effort to think a problem through on a rational basis, using the information, however inadequate, which it has in its possession. These are symptoms of grave danger. Sooner than we think, we may see the complete triumph of mediocrity. And there is only one way in which we medical men can make effectual remonstrance, and that is at the polls on each election day. Those who have made inquiry state that the *proportion of doctors who vote is only one in three*. Need I say that this is a disgraceful record? Need I urge you to consider its significance deeply, when so many public policies are formu-

lating which may advance or retard the healing art? You know what various candidates stand for, and in general, if not specifically, what type of legislation may be expected of them. Your knowledge, your judgment, is ineffectual unless you vote.

"After you have asked yourself why you are a doctor, ask yourself another question, a larger question. Are you a citizen, in fact rather than in name, if you fail to exercise the obligations of a citizen in exchange for its advantages? If we work in our own societies to preserve the integrity of medicine but fail in the larger society of American affairs to preserve the integrity of our civilization, efforts on the one part may easily be frustrated by inaction on the other."

## CONSISTENCY THOU ART A JEWEL

UP WITH THE MUSCLE AND DOWN WITH THE  
MONEY CRIES HEALTH-WEALTH

MACFADDEN

Bernarr Macfadden, who was one of the first of modern magazinists to preach the freedom of the sexes to modern youth and weary spinsters, comes out now in his widely circulated five cent weekly and announces that health advice should be as free as air and water. Mr. Macfadden is another "physician who refuses his own physic." He may *think* that the advice should be as free as air and water but he certainly charges plenty at his so-called "health hotels" for the following of it! Further Mr. Macfadden,—and we will say this for him, he has managed to retain a healthy head of hair even unto the fullness of his years—is of the opinion, according to his editorials, even if not according to the instructions to his treasurer, that all "healers," no matter what the initials after their names, should be paid by the government. *Oi! Oi!* Truly the sun in descending casts grotesque and exaggerated shadows. Even the penumbrae grow peculiar. Once Mr. Macfadden decried inferior muscular development. Now he bewails superior money complexes on the part of all "healers," and by that he means all the "Doc"—Bernarr *never did* have much use for us, and now he is trying to prevent us receiving a living wage.



## FAMOUS ACTUARY ASSERTS LAY CONTROL OF MEDICAL PRACTICE DEFINITE OBJECTIVE OF HEALTH INSURANCE

From an accredited actuary and scientific statistician with almost boundless experience of more than fifty years come these able comments upon the rapidly approaching burden of State Medicine which it would seem the United States is about to be called upon to assume. No words are minced; no facts exaggerated.

Writing on "Compulsory Health Insurance and Disease Control," Frederick L. Hoffman, LL.D., retired vice-president of the Prudential Insurance Company says in part:

"The proposed system of compulsory health insurance is *fundamentally opposed to our American conceptions of life and democracy with each and every one free to develop traits of competence and protect his own interests in sickness and health. The paternalistic system of Europe is un-American and opposed to the best interests of the population.* The system would lead to the regimentation of the medical profession, lower the standards of medical practice, impose heavy burdens on the family budget, and produce results less satisfactory than the present system. *The colossal sums that would be collected in the way of contributions would unquestionably be made the football of politics, and any doctor in the system would be compelled to concern himself, more or less, with political questions affecting his interests rather than follow his professional bent in the development of the science of medicine and make the interests of his patients his sole concern.*

"*Advocates of the system are chiefly social service workers whose philosophy of government is fundamentally opposed to that which has prevailed in the past and aims to bring about lay control of medical practice regardless of all pretenses to the contrary.* Just as Great Britain modelled its system of compulsory health insurance after German methods of social control, it is now proposed to model an American system after the British. Once such a system is established it is next to impossible to repeal it or bring about profound modification. It becomes a part of the everyday life of the people who thus enter into bondage to the State in a manner involving the highest considerations of public welfare and social progress. What follows is based on many

years of impartial study of the situation in England and on the Continent of Europe where compulsory health insurance has been in vogue for many years.

In the event that an American system becomes established it would unquestionably follow British precedent rather than German, Austrian or French which are less applicable to our situation.

"*For the social security program of the present administration, including its larger aspects of compulsory health insurance of American wage workers and low salaried wage earners, European precedents are relied upon for guidance, particularly the system in vogue in England and Wales and Scotland. The proposal rests upon the theory that vast benefits will result from such a system, for which compulsory contributions will be collected on a stated scale and dispensed by local bodies throughout the country. This would involve the establishment of a vast bureaucratic machine, the magnitude of which would be considerable.* Contributions are to be collected by deductions from the current wage, to which a stated proportion of federal and state aid will be given by way of supplementary assistance. It is claimed that under such a system the mass of wage earning population would receive decidedly better medical attention than at present is the case.

"In practice, however, it has been found that *the bureaucratic system established under such a method involves countless complications which hinder rather than help the progress of scientific medicine for the benefit of the people.* The medical profession would be divided into two classes, or those practicing state insurance and those who continue under a system of free competition in private practice. It is obviously a question of evidence as to which system is preferable for the benefit of the people."

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### BRING IN A NEW MEMBER

Help bring in at least one new member and thus forge another link in the County chain that makes up the great organization known as the ILLINOIS STATE MEDICAL SOCIETY. The stronger and more representative the group the more it can accomplish for its individual members. Your cooperation in this respect will help you and those whom you enlist in our ranks. If this were done it would give your organization tremendously increased financial

power and prestige and permit far greater accomplishments on the part of your officers for the good of all.

#### CHICAGO MEDICAL SOCIETY OFFERS BURGLAR AND HOLDUP PROTECTION

The Chicago Medical Society, through its Trustees, makes the following provision for the protection of members during 1937:

"Fifty Dollars (\$50.00) reward will be paid by the Chicago Medical Society for the arrest and conviction of any person forcibly entering or stealing the car of a member, or stealing a grip or instruments therefrom, or holding up a member while engaged in the practice of his profession during the year 1937. Only one reward will be paid for convictions on combinations of the above offenses committed contemporaneously."

The sticker on your car will identify you to the Police Department and other law enforcing officers of Cook County.

It is suggested that members use these stickers on the right hand windows of cars above the door lock.

#### A DOCTOR WRITES WISCONSIN HISTORY

Dr. P. L. Scanlan, graduate of Rush Medical College and resident of Prairie du Chien, has written a history of Prairie du Chien from the day when it was the first settlement in the northwest to the present time.

The volume is the result of fifteen years of arduous, painstaking work on the part of Dr. Scanlan. Besides study of original records of the State Historical Society and records in Prairie du Chien, such as the Register of St. Gabriel's church written in early years in French, the author visited St. Louis, Quebec and Montreal to obtain first hand information.

Three years ago he spent several months in Washington, D. C., doing research in the Congressional Library and the War Department records.

The volume particularly features this original source of material in its chapters on military occupation and fur trading days in Prairie du Chien.

The work also covers some of the history of Green Bay as well as some of the general history

of Wisconsin. The work represents an array of facts never assembled before. There are 13 chapters, approximately 300 pages, with appendices, notes, index and a few maps never used before, some of the maps made especially for the author.

The work appears in clear type and good paper and a cloth binding.

The work is published by The Banta Publishing Company, Manasha, Wisconsin. Price \$2.50.

#### STATE MEDICAL SOCIETY, SECTION OF OBSTETRICS AND GYNECOLOGY

The program for the Section of Obstetrics and Gynecology of the Illinois State Medical Society, to be held at Pere Marquette Hotel, Peoria, May 18, 19 and 20, is now being made up.

Any member of the State Medical Society desiring a place on the program is requested to give the title and an abstract of the paper and to communicate with the undersigned. It is suggested that immediate action be taken as the number of places are limited. The papers will be limited to twenty minutes and discussion to three minutes each.

Chairman of Section:

Ralph A. Reis, M.D.

104 South Michigan Blvd.,  
Chicago, Illinois.

Secretary:

F. LaV Heinemeyer, M.D.

1201 Talcott Bldg.,  
Rockford, Illinois.

#### EYE, EAR, NOSE AND THROAT SECTION OF THE ILLINOIS STATE MEDICAL SOCIETY

Chairman, Dr. John A. Cavanaugh reports that the Section will have a very interesting program at the May Meeting of the Society in Peoria, Ill. Papers will be presented by members of the Section on pertinent subjects. A number of nationally known members of the profession will take part in the program.

Dr. French K. Hansel, Assistant Professor of Clinical Otolaryngology at Washington University, St. Louis will be a guest of the Section and will present the subject of Allergy with reference to our specialties.

One afternoon of the meeting will be devoted to round table group discussions of various



phases of our specialties lead by men who know and the climax will be reached in the general session Thursday morning when one of our members will be on the general program discussion on the subject of "Infections."

C. B. Voigt, Secretary,  
1702 Broadway, Mattoon, Ill.

### WOMAN'S FIELD ARMY TO FIGHT CANCER

The Illinois State Medical Society through its Cancer Committee consisting of Dr. Bowman C. Crowell, Chairman, and Dr. J. P. Simonds, Dr. Don Deal, Dr. Roswell T. Pettit and Dr. Gatewood, has set in motion in Illinois the warfare against cancer as has been done in thirty-eight other states in the Union through the Society's cooperation with the American Society for the Control of Cancer. The present movement, which places the fight against cancer on an active plane, is made possible by the organization of the Woman's Field Army.

The State Commander of the Army, selected by the Cancer Committee of the State Medical Society is Mrs. George Thomas Palmer of Springfield, wife of Dr. Palmer who has been prominently identified for many years with tuberculosis and other public health activities. Mrs. Palmer has been President of the Illinois Federation of Women's Clubs, State Probation Officer and has been active in political and civic affairs.

"Fight Cancer With Knowledge" is the Slogan of the Army, the members of which, united in a common cause, will spread the gospel of prompt and competent diagnosis, making clear the fact that many cancers can be cured if discovered and treated in time. The Field Army will work in close cooperation with the State Medical Society, which will direct the medical work, the diagnostic clinics and provide medical speakers and programs for meetings arranged by the Army women.

The Field Army is being organized with a Vice-Commander in each of the eleven medical councilor districts so there may be as close a cooperation as possible between the Vice-Commanders and the Councilors. These Vice-Commanders, with the approval of the County Medical Societies or the President, recommend the appointment of County Captains. The Captains

work closely with the County Societies, where there are such, and in turn, select the local Lieutenants.

Mrs. Palmer met with the Cancer Committee in Chicago on January 8, presenting her plans of work and organization which were approved by the Committee. The Cancer Committee is the Executive Committee for the Woman's Field Army, Mrs. Palmer being the lay member.

The State Commander has consulted all the Councilors about the appointments of Vice-Commanders in their districts and has asked for leaders from all the important state organizations of women. It is hoped to make the Field Army as representative of all groups as possible.

The Women's Field Army, to do this tremendously important and much needed public health work successfully must have the warm support and sympathetic understanding of the local medical fraternity, as well as public support and financial help. These women do not pretend to be experts in cancer. They appreciate that the educational work will be carried out under the direction of the Cancer Committee of the State Medical Society and that all medical speeches will be made by competent physicians. The job of the Army is to create an audience throughout the entire state for cancer education and to form an aggressive and militant organization waging a war of facts against cancer, a war to save human life.

The first objective of the Army is the Enlistment Campaign, March 21-27, in which it is hoped that thousands of women will be enrolled as members at one dollar. The funds thus raised will go to support the future work of the Army. Men and women alive will be asked to contribute but only women are enrolled as members.

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Bacteriologic studies in subacute bacterial endocarditis indicate that rough types of *Streptococcus viridans* are associated with the more virulent attacks of endocarditis whereas the smooth variety is found more frequently in the chronic cases. This finding indicates the importance of bacteriologic studies in this disease. Fox H., *J. Infect. Dis.* 58:230 (May-June) 1936.

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A new vitamin (vitamin P) which cures pathologic permeability of the walls of capillaries to plasma protein, is reported. The new vitamin, closely allied to vitamin C, is found in Hungarian red pepper and lemon juice, and is apparently flavon or flavonol glycoside, one of the vegetable dyes. Rusznyak & Szent-Gyorgyi, *Nature* 138:27 (July 4) 1936.

## MEDICAL ECONOMICS

W. M. Hartman, M. D.  
E. P. Coleman, M. D.  
John R. Neal, M. D.  
Ralph Peairs, M. D.  
P. H. Kreuscher, M. D.  
C. E. Wilkinson, M. D.

Edited by the Committee on Medical Economics  
of the

Illinois State Medical Society  
E. S. Hamilton M. D., Chairman  
Kankakee, Illinois

H. M. Camp, M. D.  
R. L. Green, M. D.  
I. H. Neece, M. D.  
R. K. Packard, M. D.  
C. B. Reed, M. D.  
C. S. Skaggs, M. D.

Address all letters and communications to the Chairman.

The two new subjects to come to the attention of the doctors of the state are the Campaign of Education on the subject of Syphilis and the Refresher Courses on Child Welfare in several counties of the state. The campaign of the first is well under way as we all know from reading practically any newspaper in the state. Dr. Jirka, Director of Public Health, has been most active in the campaign and has been able to enlist practically all sections of society in the problem. His close cooperation with the medical profession assures us that he will see that the rights of the medical profession are not infringed on. At a recent meeting of the Council it was voted to cooperate with him in the campaign. The Secretary of the Illinois State Medical Society attended the preliminary meeting at Washington last month and made a most comprehensive report at the January meeting of the Council as to what went on at that meeting. It is to be hoped that he will have a report of the meeting in this issue of the Illinois Medical Journal. It was announced at the Council meeting that free medication was now available at the Springfield office of the Director for the treatment of syphilis. All that is necessary is to write to them requesting the medicine. This should make the treatment of the disease much easier and less expensive to both the patient and the physician, who in the past has lost much money by treating without pay patient who either would not or could not pay. In either event the cost of the medication was borne by the individual physician. This, of course, was wrong and resulted in physicians refusing to render such treatment on any basis other than cash. This new arrangement will permit the physician to continue the treatment of the borderline cases with assurance that he will not have to spend his own money in the purchase of the drugs. We feel that the medical profession should cooperate fully in this work as long as it is carried along ethical lines, and we feel sure that as long as it is

under the direction of Dr. Jirka no other lines are to be feared.

There will probably be considerable space in this issue of the Journal, given to the Refresher Courses in Obstetrics and Pediatrics, which are to be furnished free to the doctors of selected counties of the state, where the infant and obstetrical death rate is high. This work is to be financed under one of the titles of the Social Security Act. It is to be under the supervision of a special Committee selected by the Governor called The Committee on Infant and Maternal Welfare in cooperation with the State Department of Public Health. Again Dr. Jirka will be able to assure the medical profession that its rights will be respected. The personnel of the Committee contain such names as Dr. F. H. Falls, Dr. F. C. Grulee and Dr. Ferguson, in addition to Dr. Jirka. They have already selected a director for the work and will start the courses through the active cooperation of the local county medical society. If your county society is one of those selected for the work, we believe that you can be assured that it will be carried on in a strictly ethical manner and that you should cooperate fully at least until you are convinced that there is just cause for complaint. In that event, the facts should be brought to Dr. Ferguson, who as Chairman of the Committee on Education of the Illinois State Medical Society has been instructed to make use of his Committee to further the work. Like all new projects, some time must be allowed for organization and preparation for the courses.

We wish to remind the medical profession of Illinois that the annual meeting of the Northwest Regional Conference will be held at the Palmer house in Chicago on Sunday, February 14. This is an all day meeting, beginning at 9:00 A. M. and given over to discussion of subjects of economic interest. Every physician of the state is invited. There is no registration fee. The President and Secretary of every County



Medical Society should make an effort to attend the meeting. The officers of the Illinois State Medical Society expect to attend as well as the members of this committee.

The report of the Committee on Group Hospitalization, under the Chairmanship of Dr. C. E. Wilkinson of Danville, made a report at the January meeting of the Council and the same will be found following this article. The committee has done a large amount of work and their report should interest every thinking medical man of the state, particularly in the larger cities, where the formation of some kind of a group for Hospitalization will be proposed in the near future if any success attends the plans now in operation in Chicago and Peoria. Information to the Chairman of the committee says that at a recent meeting of the Council of the Chicago Medical Society, the Chicago plan was refused endorsement by a six to one vote. Such a vote should definitely answer the question, but we believe that the stand of the medical profession will not stop the plan being put in operation. The public appeal of the plan, the clever publicity used and the intelligence of the proponents make its continuance almost a matter of necessity. How well it will work out depends on many things and it is not smart to prognosticate. It is regrettable that if the plan will go on, the medical profession cannot and will not have a strong voice in the management of the same and the control of possible variations in the same.

E. S. Hamilton,  
Chairman of the Committee  
on Medical Economics.

To Dr. E. S. Hamilton,  
Chairman Medical Economics Committee  
Subject:—Group Hospitalization

From Dr. C. E. Wilkinson,  
Chairman Sub-Committee on Group Hospitalization

Your Committee on Group Hospitalization began the study and investigation of the plan in the late summer of 1934. We found it a not especially recent plan. Some of the larger universities for some years have offered their student body an opportunity to participate in a so-called Hospital Service Plan. The University of Illinois has been operating a hospital service to the students since 1899. A sufficient number of students have subscribed to the plan to keep it in effect since its inception. Rockford, Illinois, has

had a Hospital Service Plan in operation for the past twenty or more years. Dr. E. H. Weld reports that the plan is operating satisfactorily to the public, the hospitals and the physicians. Families of the workingmen in England have been able to pay their hospital bills through such voluntary insurance plans for more than ten years.

Dr. Justin F. Kimball of Baylor University, Waco, Texas, is given credit for organization of the first Group Hospitalization Plan that received nation-wide attention. In December, 1929, he formed a group of 1250 school teachers for hospital insurance at a rate of fifty cents per month, which operated successfully. This was for a single hospital.

Two factors that had much influence in bringing out some plan to reduce hospital expenses were: first, the report of the committee headed by Dr. J. Lyman Wilbur on the "High Cost of Medical Care," in which much stress was made on the expense of hospital care, placing it beyond the reach of the person with a low income; and second, with the advent of the economic crisis of 1929, hospitals suffered the ills of industry and experienced a decrease in bed occupancy, rising deficits, and in many cases approaching bankruptcy with consequent closure, created a panic psychology among hospital managers that led them to grasp at any proposal that sounded plausible.

In February, 1933, the American Hospital Association officially endorsed the principles of group budgeting for hospital care and also outlined certain features, which characterized a plan of Group Hospitalization as follows:

1. *Emphasis on Public Welfare, Rather Than Hospital Finance.* These plans were intended to enable subscribers to budget hospital bills, rather than to provide revenue to hospitals.
2. *Limitation of Hospital Services.* The benefits to subscribers should not include the services of private physicians.
3. *Free Choice of Hospital.* Subscribers should be free to choose from among several hospitals at the time of illness and no provisions should interfere with a subscriber's choice of physician or surgeon.
4. *Non-profit Sponsorship and Control.* Representative groups in the community should sponsor and control hospital service plans, rather than private investors who are primarily concerned with personal gain.
5. *Economic and Actuarial Soundness.* Expert judgment and opinion should be availed of in planning the

subscription rates, scope of benefits, payments to hospitals, etc.

6. *Dignified and Ethical Promotion and Administration.* The costs of administration should be as low as consistent with efficient control, and all public relations should emphasize the advantages of group-budgeting, rather than the merits of individual hospitals.

In March, 1934, the American Hospital Association reported that thirty cities in twenty-one states had started Group Hospitalization and that many other cities, notably New York, were giving special consideration to some plan of hospital insurance. Since the plan of Group Hospitalization was an insurance and must be operated under the Insurance Department of the State, special legislation had to be enacted. This was the case, as in New York, Alabama, North Carolina and Illinois and it caused some delay.

Your Committee communicated with physicians, many of whom were officials or ex-officials of the American Medical Association, connected with the Group Hospitalization Plan in different cities in the United States and practically all reports were favorable to the Plan.

At the Rockford meeting of the Council in January, 1935, we made the following report:—

"Considerable information on this subject has been garnered from various sections of the country where Group Hospitalization is in practice, all of laudatory character. It would appear to this sub-committee that there are many points in favor of such a plan. However, we feel that there is some reason for hesitancy in recommending such a move at the present time. There are certain pitfalls in the form of schemes for socialization of medicine. Unqualified endorsement of Group Hospitalization might lend encouragement to an allied plan for Group Medical Care at this moment of economic frenzy.

We suggest, however, that any community of members of our society wishing to inaugurate a Group Hospitalization plan receive hearty co-operation from this council, and whatever assistance we may be able to give, provided the specifications include the following tenets:

1. The plan must be acceptable to the local county society.
2. The majority of the board of control must be in the hands of the local county society.
3. The organization must be not for profit.
4. The plan must in no way involve medical service.
5. There must be no interference of the relationship between the patient and the physician of his choice.
6. The plan should be open to all hospitals of the Community."

During the year 1935, Group Hospitalization developed rapidly over the United States and by January, 1936, some form of budgeting for hos-

pital service was in operation in over fifty communities in about thirty states. The plan differed to some extent in different communities but all featured the non-profit sponsorship and control and assured hospital service for a period of three weeks for a monthly payment of fifty to ninety cents.

Time will not permit a detailed description of the different plans of Group Hospitalization in operation. The Washington D. C. and New York Plans are followed by many states. The form set-up of these communities is as follows:

Washington Plan of group hospitalization;  
*Group Hospitalization, Inc.*, Transportation Building,  
E. G. Henryson, Director.

Established July, 1934. 18,000 subscribers enrolled December 31, 1935. Non-profit association with salaried employees; loan from Community Chest; 9 participating hospitals.

Subscription rates: \$1.00 registration; \$9.00 yearly to employed groups only.

Hospital service benefits: 21 days board and room service (semi-private accommodations), general nursing, operating room, anesthesia, laboratory, medicine, dressings; 10% discount after 21 days; x-ray service not included; maternity cases accepted (with delivery room and nursing service) at no extra charge, after 10 months.

New York Plan of Group hospitalization;  
*Associated Hospitals of New York, Inc.*, 370 Lexington Ave., Frank Van Dyk, Executive Director.

Established May 7, 1935. 40,000 subscribers enrolled December 31, 1935, including 5,000 dependents; 149 participating hospitals in Greater New York and northern New Jersey.

Subscription rates: For semi-private accommodations only; no registration fee; \$0.90 monthly, \$2.50 quarterly, \$5.10 semi-annually, \$10.00 annually; dependents enrolled at same rate and same benefits as employed persons; monthly payments through places of employment only; others may be made direct to Associated Hospitals of New York, Inc.; minimum of 10 subscribers in employee groups; age limit 65; no physical examination; no occupational restrictions or salary limitations; 10 day waiting period for ordinary sickness, none for accidents or emergencies; 10 months waiting period for obstetrical cases; patient admitted only through physician.

Hospital service benefits: Semi-private room, operating or delivery room, laboratory, films and fluoroscopies, x-ray, ordinary drugs and dressings, anesthesia if given by a hospital employee, basal metabolism tests, insulin, serums. Patient receives \$4.50 credit on room rate when occupying private rooms at own request. Foregoing benefits for 21 days, one-fourth discount thereafter.

Payments to hospitals: Hospitals reimbursed at flat



rate of \$6.00 per day for services to subscribers for 21 days and at \$1.50 thereafter indefinitely.

Officially endorsed by local medical society.

St. Louis has had Group Hospitalization in operation for the past eight or nine months. It is a unit of the Medical Economic Security Program. (They claim it is the first instance in this country where a Medical Society inaugurated its own Group Hospitalization program.) It is operating under the Medical-Dental Service Bureau of St. Louis. The Missouri State Medical Society has endorsed the plan and they claim it is operating to the full satisfaction of the medical profession as well as the hospitals. The officers are members of the Medical and Dental professions.

Other State Medical Societies have endorsed Group Hospitalization and are cooperating in its operation. The Medical Society of the State of North Carolina is a joint sponsor of the statewide plan in that state. The Alabama State Medical Society is co-operating with the Hospital Service Corporation of Alabama in the Group Hospitalization plan. A letter from Dr. C. N. Carraway of Birmingham, Alabama, Treasurer of the Corporation, states that "we are getting one hundred per cent support from the hospitals and medical profession." In closing his letter, he states: "By the way, the law requires that there be one rate governing the State in regard to charges for services and the rate paid the hospitals for services rendered. This is incorporated in the State Law. The medical profession thought it best to do this to cut out bidding and underbidding and that all the rates charged must be approved by the State Hospital Association, State Board of Censors of the Medical Association, and the Insurance Department of the State of Alabama. It is truly a non-profit corporation and can not pay any dividends to anyone. The rates can be lowered or raised according to cost of operation, according to State Board of Censors of the Medical Association, the Alabama Hospital Association and the Insurance Department."

The legislature of Illinois passed a law in June, 1935, legalizing hospital insurance and since that time only two applications have been filed for the privilege of starting the plan of Group Hospitalization; viz., the Hospital Service Corporation of Chicago; and one from Peoria. I have not learned the progress of the Peoria

plan but they report that the Peoria County Medical Society has endorsed the plan. A recent letter from one of the officials of the Chicago plan stated: "The Chicago Plan was offered to the public December 11, 1936. The first two Companies to participate in the plan were National Broadcasting and Rand McNally. All of the leading hospitals in Chicago have signed the contract with the Corporation. I have heard that only one hospital medical staff voted against it. However, I have not verified this rumor. The Chicago Medical Society has not taken official action regarding it nor has the Hospital Service Corporation asked them for approval. They have been invited to appoint two members to serve on our Board of Directors that will be comprised of five physicians, five hospital trustees and five hospital administrators.

"The Corporation has, in its files, approximately 400 letters from employers of labor requesting that the plan be explained to their employees as the result of the very small amount of publicity to date. In view of the interest being shown in the plan increased publicity is not indicated."

Through the courtesy of Dr. Charles B. Reed, I was privileged to attend a meeting of the Council of the Chicago Medical Society, November 24, 1936, at which time the plan for Group Hospitalization was presented by officials of the Hospital Service Corporation. A recent letter from Dr. Robert Hayes, Secretary of the Chicago Medical Society, stated that, "the Committee has had several meetings but as yet has not arrived at any definite conclusions in regard to the plan."

In the many communications we have had from physicians and hospital officials where Group Hospitalization is in operation, a general expression of approval is dominant and great public interest is shown. In most places there is a constant increase in the number of subscribers. New York now reports about 250,000 subscribers and nearly 1,000 new subscribers daily and are now offering 28 days hospital service.

Dr. J. Howard Beard, Health Officer of the University of Illinois, in replying to my inquiry about Hospital Service Plan for students, December 23, 1936, stated: "In conclusion, I think it might be properly said that the arrangement of the Students' Mutual Benefit Association is thoroughly satisfactory to local physicians, that a number of them on many occasions have rec-

ommended its being made compulsory for all students, that this semester about 7,500 students are members of the Association, and that there is a movement on foot among the students themselves to have an arrangement whereby all students would be required to join the Association. This will probably not become effective until the McKinley Hospital has more beds. Sooner or later the bed capacity of the hospital will have to be increased due to the fact that the local hospitals are about up to capacity and they do not take patients with communicable diseases. The membership fee is \$3.00 (semester), no payment is made for doctors' bills, the student selects his own physician who renders him whatever bill he thinks is equitable."

Students may not come in the same class as the groups in business and industry. Rooming houses and fraternity buildings are not desirable places to care for the sick students and the same may be applied to the average home of the low scale wage earner.

In this report it has been my desire to report the facts concerning Group Hospitalization as I have collected them from many sources. I have avoided expressing my personal opinion. No doubt, there are many points in favor of Group Hospitalization as concerns the public, the subscriber and the hospitals but to the physicians' point of view some objections can be raised. Several years may be required to prove it a success or failure.

Group Hospitalization concerns three parties: the subscriber, the hospital and the physician. Each is necessary for its successful operation; surely the medical profession should have some representation and control of such a plan, as suggested in our report in January, 1935.

In Conclusion, we may say that:—

1. Group Hospitalization is not a dream or something imaginary. It is a live subject and in active operation.

2. The plan is not entirely new. It is not a "New Deal."

3. The plan of budgeting for hospital service has made and is making a wonderful appeal to the lower bracket wage earner and the public.

4. The plan offers or assures the hospital compensation for use of its facilities of service.

5. The plan may lead to budgeting for Medical Services or Health Insurance.

6. The plan may lead to rivalry or competition among hospitals in which they exploit the members of their staff.

7. The plan has been endorsed by many state, county and city medical societies.

8. There is no apparent reason that the Council should at this time endorse the plan.

9. The plan concerns three parties: the subscriber, the hospital and the physician. One to be served and two to render the service. To be successful there must be cooperation.

10. "Medicine is not entirely dependent, neither can it be exactly independent. Without the public there would be no medicine, without medicine there would be no public; then, medicine is inter-dependent with the public."

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## Correspondence

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### SMALLPOX

*All Physicians in Illinois:* The attention of the medical profession of the State of Illinois is called to the fact that there is an existent outbreak of smallpox in Beardstown, Cass County, which has already extended to Morgan, Shelby, Rock Island, Vermilion, Sangamon and Cumberland Counties.

In order to prevent a potential epidemic the physicians of Illinois are asked to immediately begin vaccinating those patients who either have never been successfully vaccinated or who have not been successfully vaccinated within the past five years.

It is essential that cases or suspected cases be reported immediately to the local health authorities in order that prompt isolation and quarantine may be instituted. If there is any doubt as to diagnosis particularly from the point of view of differentiation between chickenpox and smallpox, upon request the Illinois Department of Public Health will be glad to immediately supply a member of its staff for final decision in the matter. Where there is any doubt as to diagnosis, the case should be reported as a case of suspected smallpox until final disposition is made.

The attention of the physician is called to the fact that every case of smallpox seen by us to date in this recent outbreak has had an acute onset with a fever of 102 to 104, chills, headache, backache and generalized aching followed



at the end of the third day or the beginning of the fourth day by a papular eruption appearing on the face, anterior surfaces of the wrist, then the remainder of the upper extremities, the upper thorax and anterior surfaces of the lower extremities. The palms of the hands and the soles of the feet have been rather extensively involved. All cases to date have been of the discrete variety.

In view of the existent outbreak, any unvaccinated individual presenting the symptoms of influenza should be looked upon with suspicion and should be watched closely for the first three or four days for the possible development of the typical eruption of variola. It should also be emphasized that the diagnosis of chickenpox in an adult must be made with extreme caution inasmuch as the majority of such cases eventually prove to be smallpox.

The virus for vaccination against smallpox will be supplied by the Illinois Department of Public Health free of charge to any physician upon request.

Frank J. Jirka, M.D.,  
Director of Public Health.

#### DR. ANNA M. BRAUNWARTH

A member of the Chicago Medical Society since 1897, Dr. Anna M. Braunwarth will celebrate her eightieth birthday on January 11, 1937.

Dr. Braunwarth was born January 11, 1857, at Muscatine, Iowa, and graduated in medicine in 1886 from Northwestern University Woman's Medical College.

In the Braunwarth family, three of the sisters were physicians, and all practiced medicine over fifty years. Dr. Sarah Braunwarth, deceased, practiced fifty-two years. Dr. Emma Braunwarth is now in her fifty-sixth year of active practice at Muscatine, Iowa, and Dr. Anna M. Braunwarth is entering her fifty-first year of practice here in Chicago.

Dr. Anna Braunwarth taught medicine at Iowa State University and at the University of Chicago under Dr. Ralph Webster and Dr. Howard T. Ricketts. She was surgical assistant to Dr. H. T. Byford for nine years.

As a regular attendant at medical meetings, both of the Central Society and the Branches,

no one can approach Dr. Braunwarth's faithful record.

The Chicago Medical Society wishes to extend its heartiest congratulations to Dr. Braunwarth on her eightieth birthday.

Thomas P. Foley, M.D.  
President.

Chicago Medical Society Bulletin

#### EDUCATIONAL COMMITTEE SPONSORS NEW PRESS SERVICE

The Educational Committee is preparing to furnish a new style health column to newspapers of Illinois. Believing that editors might be interested in short, terse, clear statements concerning health conditions prevailing each week in the state, such material is being prepared for publication.

The first article on *Pneumonia* was sent out on January 28th and on February 1st editors of Fifty newspapers had sent in requests to be placed on the mailing lists to receive similar articles every week.

#### PNEUMONIA TAKES ITS TOLL

According to reports issued by the State Department of Public Health of Illinois, pneumonia reached a considerably higher reported prevalence peak as the New Year began than at any previous time since December, 1923. For the week ending January 4, 1937 a total of 1,056 cases were reported. The peak of the epidemic wave has past but because prevalence is likely to continue at a relatively high level until April there are certain facts the public should know.

\* \* \*

Pneumonia is an acute inflammation of the lungs caused by a definite germ—the pneumococcus. It is a disease in which the patient is extremely ill from the very onset; it runs a relatively short course, seldom lasting over seven to nine days, at the end of which time, if the patient gets well, the fever suddenly disappears and the patient is on the road to recovery. On the other hand, it is a disease of such severity that for the population as a whole the death rate is the highest of the acute infectious diseases.

\* \* \*

Many cases of pneumonia are preceded by an ordinary cold, which may have lasted from a few days to several weeks before onset of pneumonia. While every cold is not followed by pneumonia, the fact that nearly every case of pneumonia is preceded by a cold means that colds should receive more attention from the public than has been true heretofore. Colds are responsible for more "lay off" periods among workers than any other disease.

\* \* \*

It is extremely unwise to try to work off a cold, or to keep going, waiting for it to wear itself out. Any individual who is suffering from a cold or temperature

or severe cough, should take sufficient time away from his work to make a complete recovery.

\* \* \*

Chronic alcoholism, chronic diseases as Bright's disease, heart disease, diabetes, and such conditions as poor nourishment, or if you wish, ill health are all predisposing factors to the acquiring of pneumonia. Persons who have these conditions should take unusual care of avoiding exposure.

#### WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

To many wives of physicians it is not easy to define the objectives of the Woman's Auxiliary to the Medical Profession.

To the active members of our auxiliary there is a clearer conception of these objectives which we classify under the headings: Educational, Social and Philanthropic.

In this article we shall consider only the educational phase.

Since we, the doctor's wives, are a part of the laity, and because we are peculiarly fitted by virtue of our position in the doctor's home, living in an atmosphere of health consciousness, we can be leaders and teachers in the matters of health in our respective communities.

To be well informed we need the *Hygeia Magazine*—the text book on Health Education, whose policy is—"To interpret to the layman in simple understandable language information about scientific measures that are now employed or may in the future be used in prevention and cure of disease. It likewise aims to deal with economic, social, political, industrial and educational problems so far as they have a bearing on the health and welfare of the people."

The policy of the Hygeia Committee of the Woman's Auxiliary to the American Medical Association, of which we the State Hygeia Committee are a component part, is, stating it briefly—"To try earnestly to inspire our physicians' wives to read and study *Hygeia* and therefore become better acquainted with its value to the physician, not only by stimulating respect for the high ideals of the profession but by educating our people against the danger of accepting advice from quacks, cults or any untrained person not qualified for giving out anything so vital as information regarding our life and well being."

And so, in the final analysis, may I, as Chairman of this committee, appeal to every physician's wife in Illinois to place her subscription for *Hygeia*. If you will do this, reading each issue carefully, you will find you will be qualified to answer the questions of the lay mind in your club and your community. You will become a Missionary of the Gospel of Good Health and your husband will place a copy of *Hygeia* each month on his reception room table that his patients may be informed in the best interests of organized medicine.

INEZ HOLE (MRS. M. L.),  
Chairman Hygeia Committee Woman's  
Auxiliary to The Illinois State Medical Society.

#### NORTHWEST MEDICAL CONFERENCE

Palmer House

CHICAGO, ILLINOIS

Sunday, February 14, 1937

8:00 A. M.—BREAKFAST—8:00 A. M.

Informal discussion. Questions to be written and handed in—and assigned to individuals for discussion.

Election of Nominating Committee

Morning Program—9:30 A. M.

President W. F. Braasch, M. D., Rochester, Minn., Presiding.

#### Postgraduate and Economic Education

Symposium on Postgraduate Education:

- 9:30—Report of Survey—R. L. Sensenich, M. D., South Bend, Ind.
- 9:50—University Courses—Harold S. Diehl, M. D., Dean, University of Minnesota Medical School, Minneapolis, Minn.
- 10:00—Refresher Courses—M. H. Rees, M. D., Dean, University of Colorado School of Medicine, Denver, Colo.
- 10:10—Formal Local Courses—S. D. Maiden, M. D., Council Bluffs, Iowa.
- 10:20—Interstate Postgraduate Courses—J. D. McCarthy, M. D., Omaha, Neb.
- 10:30—Clinic Courses—Herman H. Riecker, M. D., Ann Arbor, University of Michigan.
- 10:40—Discussion led by—Ralph R. Wilson, M. D., Kansas City, M. C. Smith, Executive Secretary, Nebraska State Medical Society, Curtis.

Symposium on Medical Economics:

- 10:55—Economic Education—E. J. Carey, M. D., Dean, Marquette University School of Medicine, Milwaukee, Wis.
- 11:15—Economic Education of the Medical Student—Wm. J. Burns, Executive Secretary, Michigan State Medical Society, Lansing, Mich.
- 11:25—Economic Education of the Doctor—E. S. Hamilton, M. D., Kankakee, Ill.
- 11:35—Discussion led by—E. F. Kemper, M. D., Denver, Colo.; T. F. Thornton, M. D., Waterloo, Iowa.
- 11:50—Greetings from the American Medical Association—Olin West, M. D., Secretary, Chicago, Ill.
- 12:05—Hospital and Health Insurance—James L. Smith, M. D., Peoria, Ill.
- 12:20—Discussion led by—John R. Neal, M. D., Springfield, Ill.; Carl F. Vohs, M. D., St. Louis, Mo.; T. A. Hendricks, Executive Secretary, Indiana State Medical Society, Indianapolis, Ind.

LUNCHEON—12:30 Noon

Guests of the Iowa State Medical Society

Remarks by President W. F. Braasch

Election of Officers for 1938.

Afternoon Program—2:00 P. M.

Symposium on Social Security Activities.

- 2:00—Survey of Activities of State Governments and and State Medical Societies—Chas. S. Nelson,



Executive Secretary, Ohio State Medical Society, Columbus, Ohio.

- 2:30—Maternal and Child Welfare—Alfred W. Adson, M. D., Mayo Clinic, Rochester, Minn.
- 2:45—Public Health Services (Resettlement Administration)—A. D. McCannel, M. D., Minot, N. D.
- 3:00—Discussion led by—S. E. Gavin, Fond du Lac, Wis.; Elmer G. Balsam, M. D., Billings, Mont.
- 3:30—Venereal Disease Program—Arthur D. Gray, M. D., Topeka, Kan.
- 3:45—Discussion led by—Paul A. O'Leary, M. D., Rochester, Minn.; Earl Whedon, M. D., Sheridan, Wyo.
- 4:00—State Boards of Health—Frank J. Jirka, M. D., Director of Public Health, State of Illinois, Springfield, Ill.
- 4:15—Discussion led by—Philip H. Kreuscher, M. D., Chicago, Ill.; J. F. D. Cook, M. D., Langford, S. D.

#### CALIFORNIA STATE ASSOCIATION INCREASES ANNUAL DUES

*California and Western Medicine*, December, 1936, is authority for the following:

At the annual session of the California Medical Association, held in Coronado, May, 1936, the House of Delegates approved the recommendation of the Reference Committee that, for the year 1937, the dues of the State Association be increased by \$5. The vote by the House of Delegates on the Reference Committee's recommendation was unanimous, not a single one of the more than one hundred delegates, representing the thirty-nine component county societies, asking any questions or making any protest. This unanimity was not to be interpreted as an expression of indifference on the part of the delegates concerning the hardship that might be caused by the five-dollar increase in State Association dues, but rather as a recognition by the seated members concerning the issues confronting the medical profession at the present time—issues which are so vital to the interests of each member that, even though it might hurt to give, there was no other logical course to follow, if the collective and individual welfare of members of the Association were to be adequately safeguarded during the coming legislative year.

#### ARMOUR LIGATURES

Armour and Company has been licensed to import surgical ligatures and sutures into Great Britain, it was announced by S. B. Bradshaw, manager of the Armour Laboratories.

"Regulations for sale of ligatures and sutures in the United Kingdom are very stringent," Mr. Bradshaw said. "The British Ministry of Health is empowered to prohibit the sale of any therapeutic substance which fails to meet its standards. Products are subject to constant tests and licenses may be withdrawn at any time. All licenses must be renewed by the manufacturers or importers every two years.

"Entirely new facilities enable the Armour Labora-

tories to manufacture and sterilize ligatures by processes which meet with the full approval of the British Ministry. The same products are sold in this country."

#### HOSPITALS SPEAK

*The Medical Recorder*, December, 1936, is authority for the following:

It is reported that the Association of Oregon Hospital meeting December 8, 1936 in Portland resolved that their members would no longer extend special low rates to certain groups enjoying such privileges in the past. Henceforth all organizations would be charged the State Industrial Accident Commission rate, which rate is at the present \$2.57 per ward bed per day. However, on and after January 1, 1937, the rate for State cases is to be raised to \$3.00. This then will be the minimum rate extended any individual or organization. It was further reported that the actual cost of operation per patient per day averages about \$4.00 amongst the various hospitals, and private individual patients must accordingly be charged enough additional money per day to balance the operating budget.

As in the past, when the financial circumstances of a patient render him unable to pay the regular rate, a special rate will be permissible.

#### MID-WEST CONFERENCE ON OCCUPATIONAL DISEASE

"The Mid-west Conference on Occupational Disease will be held at the Hotel Statler in Detroit, on May 3-7 inclusive, in conjunction with the annual meetings of the American Association of Industrial Physicians and Surgeons, and Michigan Association of Industrial Physicians and Surgeons."

Adequate treatment in suprarenal insufficiency may entail the use of large doses of cortical extract and saline. In an unusually severe case showing marked neurologic symptoms a prompt response followed injection of 3500 cc. of normal saline and the administration of 50 cc. of cortical extract. Treatment with large doses of saline and cortical extract was continued in this case for a week. This report concludes that: "Recovery even from the severest degree of suprarenal insufficiency is possible if adequate amounts of cortical hormone and sodium salts are given." Snell and Morlock, *Proc. Staff Meet. Mayo Clin.*, 11:551 (August 26) 1936.

Serum sickness is favorably influenced by administration of calcium salts. Using alternate case method of treatment it was found that calcium gluconate, by parenteral injection, reduced duration of the rash from 5.4 to 2.9 days. In the controls, symptoms (itching, arthralgia, etc.) lasted 7.1 days as compared with 3.3 days for the treated group. Curphey and Solomon, *New England J. Med.* 214:150, 1936.

Original Articles

REDUCING INFANT MORTALITY

HENRY C. NIBLACK, M. D.

Chief, Bureau of Child Welfare, Board of Health  
CHICAGO

The content of this discussion relates to the situation in Chicago because I am most familiar with it.

Thirty years ago, in Chicago, out of every thousand babies born 115.5 died before they were one year of age. Thirty years is chosen because it is an easy number to remember; there had been rates slightly lower before and there were to be much higher rates to come. The succeeding years are punctuated with such records as: In 1908, 128.3 the highest rate since the

Read before Section on Public Health & Hygiene, Illinois State Medical Society, Springfield, May 19, 1936.

beginning of the century; in 1913, 122.3; in 1916, 122.4. During the twenty-year period succeeding 1916 and bringing us to the present, there has been a continuous decline in the rate; in 1935, the rate of 40.1 was attained, the lowest of all time and the lowest rate among the largest cities of the United States. It is due to unflagging enthusiasm and interest in saving babies' lives on the part of Dr. Herman N. Bundesen that this rate has been achieved, first as Commissioner of the Department of Health and lately as President of the Board.

This decline over the thirty-year period is shown in the graph.

Such a consistent and continued decline could not have come about by chance. There must have been a systematic application of forces at certain or all points to have caused the curve to follow the direction indicated by the statistics.

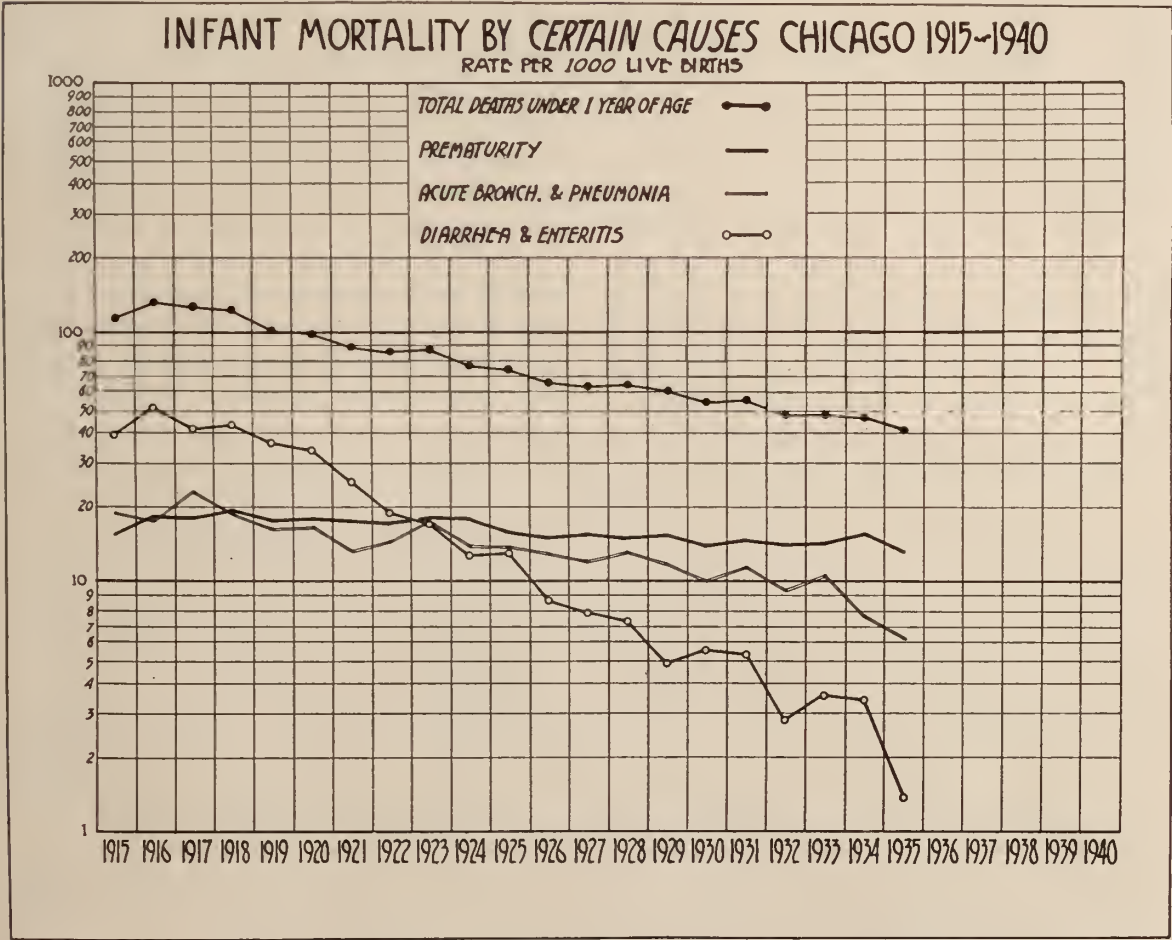


Chart 1. Showing Infant Mortality in Chicago, by Certain Causes, 1915-1935.



TABLE 1—CAUSES OF INFANT DEATHS THE FIRST YEAR OF LIFE

	1905	1908	1935		
Mortality rates .....	115.5	128.3	40.1		
Causes	Total	Total	Male	Female	Total
Measles .....	48	50	2	4	6
Scarlet Fever .....	5	24	2	1	3
Whooping Cough .....	187	63	13	16	29
Diphtheria .....	24	47	1	1	2
Influenza .....	19	29	6	3	9
Dysentery .....	22	30	2	0	2
Erysipelas .....	28	35	7	3	10
Epidemic Meningitis .....	0	101	5	1	6
Tuberculosis .....	102	96	10	9	19
Syphilis, Congenital .....	80	92	15	7	22
Thymus gland disease.....	..	..	13	11	24
Diseases of Ear and Mastoid..	5	..	7	4	18
Diseases of Circulatory system	34	37	8	3	11
Bronchitis .....	401	425	11	8	19
Pneumonia .....	851	851	180	122	302
Diarrhea and Enteritis.....	538	2606	45	24	69
Intestinal Obstruction .....	36	38	7	11	18
Peritonitis .....	..	..	1	2	3
Congenital Malformations....	108	526	125	109	234
Congenital Debility .....	441	484	7	2	9
Premature Birth .....	343	633	403	287	690
Injury at Birth.....	54	234	147	92	239
Diseases Peculiar to Early Infancy .....	229	1117	74	51	126
Accidental and Violent Deaths	39	334	7	18	25
Leukemia .....	3	0	2	2	4
Meningitis—Simple .....	..	..	2	4	6
Cerebral Hemorrhage .....	9	15	1	3	4
Convulsions .....	476	188	4	0	0
Diseases of Nervous System..	..	353	1	2	3
Pleurisy .....	..	1	7	1	8
Diseases of Buccal Cavity....	1	6	7	3	10
Pyelitis .....	1	..	3	3	6
Phlegmon .....	..	..	4	0	4
Diseases of Skin, Annexia....	13	27	3	3	6
Infanticide .....	3	53	7	1	8
All Other .....	..	..	19	13	32
Grand Total .....	5831	6888	1158	825	1983

This table is presented because it shows the whole picture of the problem of saving infants' lives. It tells the story of past accomplishments and points the way to future efforts.

It is most interesting to study this table in the light of knowledge of what has been taking place. Our attention is first caught by the group of contagious diseases at the beginning of the table. There is now, undoubtedly, a better understanding of the control of contagious diseases; is it possible that quarantine has justified itself? Has the use of serums and vaccines been effective in protecting infants' lives? In the case of diphtheria we feel that active immunization of babies under one year of age must have had a great deal to do with the decidedly lower death rate from this cause in 1935 than in 1905 or 1908. It is too soon even tentatively to draw conclusions as to immunization against scarlet fever and whooping cough as these measures have not been applied to large numbers.

The tuberculosis figures are significant when we remember that this has been a most active period in the control of this disease. Certainly, I think we have a right to believe that the good results of this program are reflected in the death rates of infants.

Too many babies still die from pneumonia, but notice the great improvement in the present rate over that of thirty years ago. No magic procedure has been developed in the treatment of this disease. Has our modern regimen of child care developed a greater resistance to this disease, and have we learned intelligently *what not* to do in its treatment?

And now we come to the gastro enteral group of diseases. It is usually said that the decrease in the loss from this cause accounts chiefly for the lowering of the infant death rate. But, as we are seeing, there have been other factors. I almost stated that the story of gastroenteritis has been told, but this would not have been true. There are still deaths from this cause—and probably most of them needless. Perhaps we have been lulled by a sense of false security as to our impregnable position in regard to this disease; only this year reports have been coming in, our own city among them, of outbreaks of gastroenteritis among newborns in institutions and hospitals.

Intestinal obstruction interests me. Are we making better diagnoses and operating on these cases earlier and so reducing the mortality rate? The period has seen the development of pediatrics into a major specialty. Perhaps we *do* know more *now* about an infant's abdomen than we did thirty years ago. The same might apply to disease peculiar to early infancy. Some of these we have learned to diagnose and treat. What has happened to the group known as congenital debility? Was this formerly the dumping ground for all those cases for which a better designation could not be found?

The category "Injuries at Birth," is also most interesting. Obstetrics is better today than thirty years ago. Should not better obstetrics reduce birth injuries? Hence, this record is disappointing.

Congenital malformations, I suppose, must be passed over as "acts of God" about which there is nothing to be done.

Convulsions as an entity has disappeared.

TABLE 2—Infant Deaths By Cause, Sex and Age Group—1935

INTERNATIONAL CLASSIFICATION OF CAUSES OF DEATH	Under 1 Day		1-6		Days 7-13		14-29		1		2		3-5		Months 6-8		9-11		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
7—Measles .....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	2	4
8—Scarlet Fever .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	2	1
9—Whooping Cough .....	..	..	..	..	..	..	..	..	3	7	1	4	5	2	3	1	1	2	13	16
10—Diphtheria .....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	1	2
11 a&b—Influenza .....	..	..	..	..	..	..	..	..	1	..	2	1	2	..	1	2	..	..	6	3
13 a&c—Dysentery .....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	2	0
15—Erysipelas .....	..	..	..	..	..	..	2	..	3	2	2	..	..	..	..	..	..	1	7	3
18—Epidemic Meningitis .....	..	..	..	..	..	..	..	..	1	..	1	..	2	..	1	1	..	..	5	1
23-32—Tuberculosis (All Forms) .....	1	1	..	..	..	..	..	..	..	..	..	..	1	1	2	4	5	3	10	9
34 a—Syphilis, Congenital .....	2	3	1	1	3	1	3	..	2	..	3	1	1	..	..	..	..	1	15	7
67 a&b—Diseases of Thymus Gland.....	3	2	1	3	1	1	1	1	1	1	3	..	2	2	..	1	1	..	13	11
89—Diseases of Ear and Mastoid Process.....	..	..	..	..	..	..	..	..	3	2	..	..	2	1	..	..	2	1	7	4
90-95—Diseases of Circulatory Systems.....	..	..	..	..	1	..	1	..	..	2	..	..	2	..	1	..	3	1	8	3
106—Bronchitis .....	..	..	..	..	..	..	2	1	..	1	2	1	2	2	2	3	3	..	11	8
107-109—Pneumonia (All Forms).....	2	1	9	8	7	6	21	13	26	15	20	11	47	33	19	21	29	14	180	122
119—Diarrhea and Enteritis.....	..	..	3	..	1	1	11	4	3	2	4	4	9	5	10	6	4	2	45	24
122 b—Intestinal Obstruction .....	..	..	..	1	1	..	1	..	1	..	2	1	2	3	..	2	..	4	7	11
129—Peritonitis .....	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	1	2
157 a-d—Congenital Malformations .....	25	29	36	22	12	11	12	11	13	8	7	3	11	13	7	10	2	2	125	109
158—Congenital Debility .....	..	..	..	..	2	..	3	1	1	..	..	..	..	1	1	..	..	..	7	2
159—Premature Birth .....	276	205	100	61	14	11	7	5	5	5	1	..	..	..	..	..	..	..	403	287
160 a&b—Injury at Birth .....	77	62	59	27	6	2	2	..	3	..	..	..	..	..	..	1	..	..	147	92
161 a-e—Dis. Pec. to Early Infancy.....	44	20	22	21	3	8	3	1	..	1	2	..	..	..	..	..	..	..	74	51
177-195—Accidental and Violent Deaths.....	2	1	..	1	..	1	..	1	..	2	1	2	2	6	..	2	2	2	7	18
72—Leukemia .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
79—Meningitis—Simple .....	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	2	2
82 a-d—Cerebral Hemorrhage, Etc.....	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	2	2	2	4
86—Convulsions .....	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4	0
87—Diseases of Nervous System.....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	1	2
110—Pleurisy .....	..	..	..	..	..	..	2	1	1	..	..	..	1	..	2	..	1	..	7	1
115 a1 to b3—Dis. of Buccal Cavity, Etc.....	..	..	..	..	..	..	1	..	..	..	..	1	..	..	2	..	2	3	7	3
133 b—Peyelitis .....	..	..	..	..	1	..	..	..	..	..	..	1	..	..	1	2	1	..	3	3
152—Phlegmon .....	..	..	..	..	..	..	..	..	1	..	..	..	2	..	1	..	..	..	4	0
153—Diseases of Skin, Annexa, Etc.....	..	..	..	..	..	..	1	2	..	..	..	..	1	1	..	..	1	..	3	3
172—Infanticide .....	7	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	1
ALL OTHERS .....	1	1	1	1	1	..	3	1	1	1	2	3	3	3	5	2	2	1	19	13
TOTAL .....	440	326	234	146	55	42	76	42	72	52	53	32	105	75	60	64	63	46	1158	825



The causes of the symptom, convulsions, must be diagnosed better at the present time than formerly; consequently these cases are being thrown over into other groups.

In the beginning I suggested that our table would point the way as to where our future efforts should be applied. About half-way down the table is the group of causes relating to the natal and neonatal period; e.g., Congenital Malformations, Congenital Debility, Premature Birth, Injury at Birth, and Diseases Peculiar to Early Infancy.

If we break our table down into age groups, we find that 68.6% died under one month of age, 62.7% under two weeks, and 38.7% under one day. We, therefore, see that our line of attack has not only been narrowed as to causes of death but in respect to age groups as well. At once we are led to conclude that a principal point of attack is the neonatal causes. Heretofore, our most striking results have been in the saving of lives of infants over one month of age.

These neonatal causes tie us in with the whole problem of maternal welfare, e.g., prenatal and obstetrical care. If the problem of maternal welfare can be solved, we shall have gone a long way toward reducing neonatal deaths. Therefore, we cannot consider any program for further reduction of infant mortality without thinking in terms of maternal welfare. The objectives of a well rounded out maternal and infant welfare program must include adequate prenatal and confinement care for every expectant mother. I can take time only to say that we, as a public health agency, are doing everything we can to educate the mothers of the community to go to their physicians for prenatal care as soon as they suspect they are pregnant, and as regularly thereafter as the physician advises. If a mother cannot afford to have the care of a private physician, she is guided into those channels that provide such care without cost.

The greatest problem in maternal welfare is finding the expectant mothers; e.g., those that would not go to a physician, especially for financial reasons. No one has yet originated an effective finding plan; so far the house to house canvass has been most effective.

Studying Table 1 further, we find that the

remaining major causes of infant deaths are (for 1935):

1. Prematurity .....	690
2. Malformations .....	234
3. Injuries at Birth.....	239
4. Respiratory Causes .....	359
Whooping cough .....	29
Influenza .....	9
Bronchitis .....	19
Pneumonia .....	302

1522 out of 1983

Which of these causes presents the most practical point of attack? It would be foolish to waste time trying to do anything about malformations; birth accidents and injuries, we hope, will be eliminated through better maternal care; at least be reduced to a minimum.

This leaves us the obvious points, prematurity and respiratory diseases. These are the two points we have stressed during the past two years in our community. It is to the program to reduce the deaths from prematurity that I shall devote the rest of this discussion.

*Prematurity.* No one has, as yet, defined just what a premature is, but generally speaking, it is an infant that is born before the normal time of gestation, maybe below a certain weight and perhaps of low vitality. Nor does any one know beyond what point it is hopeless to save the premature. At intervals we are impressed with reports of smaller and more premature infants surviving. Hence, it is unsafe to pass over a premature by saying there is no use trying to do anything because it is too small or too premature.

The essential conditions under which the premature has the best chance of surviving are: Warmth, proper nutrition, protection from infection, and medical direction. These things are basic and must be supplied in some way to these infants. Therefore, a program for saving premature infants must include provisions for supplying these things to these babies. In a large metropolitan community this is no small undertaking. It means much planning and co-operation with physicians, agencies and hospitals.

Briefly, the program has been carried out as follows: A group of staff nurses was trained in two of the large premature hospital stations of the city, e.g., Michael Reese and Cook County Hospitals. This training included both hospital and home care of the premature infant. The city was then divided into districts and one of

the trained nurses made responsible for the prematures born in that district.

To conduct a program in the interest of prematures, *births of prematures must be known*. Hence, a regulation was passed which required that a premature birth be reported to the Board of Health at once; the immediate report is made by telephone and this is followed by the usual official report within twenty-four hours. The item "premature" was introduced as No. 6 on the official Certificate of Birth form of the state of Illinois. The baby is referred at once to the premature nurse in that district. The following points determine the future procedure; whether the family can or cannot afford the services of a private physician; whether the baby is born in a hospital or at home. If the case is under the care of a private physician, the nurse communicates with him and is guided by his wishes. If the case is born in a hospital with adequate facilities for its care, she keeps in contact with the hospital so that she will know when the baby is discharged to its home.

As the discussion proceeds, it will be seen that the program is intended to reach especially those premature infants born into an environment unfavorable to their survival.

Complete reporting of prematures is important in another respect. So far there has been no complete report by any community of the prematures born therein. Hence, it has been impossible to know the death rate of prematures. With a complete reporting we shall have statistics on which to base any conclusion as to progress in lowering the death rate of these infants.

The first moments in the life of a premature are the most hazardous; the more so because of the frequent necessity of resorting to some form of resuscitation. Unskilled procedure or the application of wrong methods result in immediate disaster. From the records of the deaths of infants, a study was made of the methods of resuscitation used in various hospitals. Our conclusions were that any method that subjects the infant to any type of trauma is bad; especially immersion in hot and cold water, the various swinging methods, and rough artificial respiration. The use of the tracheal catheter, oxygen, and artificial respiration were the methods most frequently employed; used correctly, they are the methods of choice.

We have undertaken to disseminate through our own staff a rational idea of this procedure so that they, in turn, as they have opportunity, can spread this information to others.

Let us suppose that the infant has survived these first perilous moments of life. We are then faced with the major problem of continually and permanently supplying to him the four necessities of life; e.g., warmth, nutrition, protection against infection, and medical supervision.

*Warmth.* The ideal place for a premature infant is in a premature station in a hospital; we are fortunate to have in the city three large stations and many smaller ones. However, that all the appliances and equipment of a modern premature station are not available, is no deterrent to carrying out certain workable makeshifts and common sense procedures. There is hardly an essential feature of a premature nursery that cannot be set up even in a poor home.

One would prefer one of the modern incubators of the Hess type, with controlled heat, moisture and oxygen supply. Even the simple Nobel bed, with an electric light bulb for heating is a great advantage but not essential. A very satisfactory heated bed can be improvised with an orange crate and the heat supplied according to local conditions.

However, since we, in the city, have at hand every available modern appliance, we have tried to give as many premature infants as possible the advantage of these things. We usually urge hospital care. In the case of private physicians, these matters are left to his judgment.

A baby is prematurely born at home. Hospital care is indicated and parents and physician are agreeable. How to get it to the hospital without that fatal initial chilling! For transportation we have on call a Hess electrically heated incubator ambulance. Usually the incubator transportation service is requested at the same time that the infant's birth is reported by telephone to the Board of Health. The request is telephoned immediately to the co-operating agency handling the service; e.g., the Chicago Maternity Center; this agency was asked to be responsible because its staff of physicians is on call at all times and is skilled in procedures pertaining to the care of the newborn premature; the taxi bills are paid by the Board of Health, as are the maintenance costs of the am-



balance. The team, consisting of a physician and nurse, going out on these calls, carries equipment to do transfusions and resuscitations. A small oxygen tank is carried with the ambulance on all runs so that oxygen can be administered to the baby en route if necessary.

However, there are cases that are not sent to the hospital. Hence, conditions must be set up in the home as nearly simulating hospital conditions as possible. As a convenience, the Board of Health has provided a number of heated beds after the Nobel pattern. These are for loaning to those homes where needed. However, many hospitals that have no kind of heated bed have taken advantage of this service; there are also instances where a hospital has an incubator of the Hess type, but it may be occupied and another bed is needed. There is a surprising demand for these beds now that it is known throughout the city that they are available. When a bed is applied for by a physician, one of the premature field nurses goes into the home, sets up the bed and explains to the mother its use.

*Nutrition.* Provision having been made to keep the infant warm, the next consideration is the baby's nourishment. The food of choice is mother's breast milk. Every effort is made to develop the mother's milk supply so that she can feed her own baby. This is best in every way. No matter how breast milk is produced outside the home, it is going to cost somebody a great deal of money. However, there will always be a few mothers that will not be able to nurse their babies and who cannot afford to buy the milk at any price. Therefore, to take care of these cases a mothers' breast milk station has been established in the Board of Health. This station is distributing on an average of 125 ounces a day. We ask physicians to place the babies who are receiving milk from the Mothers' Breast Milk Station on artificial feedings as soon as the babies' condition warrants the change. This is the only way we can continue to meet the demand. Some form of lactic acid milk is satisfactory as an artificial feeding, but this is largely a matter of choice and every specialist has his own favorite method.

Because these infants are more prone to develop rickets and anemia than the normal baby, special attention must be given to their prevention. Hence, vitamin D is begun at a somewhat

earlier age than ordinarily. Many physicians advocate the use of some form of iron in their treatment, again others maintain that this is of no benefit. Ultraviolet lamps are also helpful.

*Protection from Infection.* If the baby is cared for in the hospital, this is a fairly easy matter as in a well equipped and well conducted premature nursery this danger is reduced to a minimum and is the first thought in the minds of all attendants.

In the home the situation is more difficult. The intelligence of the mother must be relied on to protect the baby from this danger. It is one of the first duties of the nurse looking after the case to train the mother and family as to the importance of protecting the baby from infection. As nearly as possible the baby is isolated from the family and family activities. Poor home conditions is one of the factors for advising hospitalization, even though the baby itself may be a promising home case. All feeding utensils and everything that goes into the baby's mouth must be sterile. Other material coming in contact with the infant, such as clothing, bed clothing, etc., must be scrupulously clean. Of prime importance is the washing of hands. In fact, if every one attending the baby, and this includes professional attendants as well, washed his hands clean before touching the baby, the safety of the baby would be, in a large measure, assured. It is especially emphasized to the mother that no member of the family or any one from the outside suffering with a cold or any infection must come in contact with the baby. If the mother herself has a cold, she must relinquish the care of the baby to some one else or wear a mask and a gown and be very careful to wash the hands before caring for the infant.

*Medical Supervision.* The whole plan of this program revolves about medical care. The cases fall into two groups. Those under the care of private physicians and those in indigent families that cannot afford the services of a private physician. The private physician can make as much or as little use of the services offered by the Board of Health as he chooses. On the whole, the physicians have seemed glad to take advantage of the service, especially those who are caring for these infants in the home. Breast milk from the Mothers' Milk Station, heated beds, incubator transportation, and the nurses'

help in the home have all been in great demand.

Medical care for the babies in families that cannot afford the services of a private physician and where the babies are not in a hospital has been a greater problem. It is admitted that the care of the premature requires at least some special understanding and experience. However, with the medical service available through the county physicians, relief physicians and service rendered by our own staff, we have done fairly well so far. When the infants are in condition so that they can be taken to an infant conference, they are referred to one of the special conferences conducted for premature infants. As soon as they reach the status of the well, normal infant, they are referred to the regular infant welfare conference. The premature nurse then discharges the baby to the regular infant welfare nurse.

Perhaps I have not sufficiently emphasized the part of the nurse in this program. After all, she is the most important factor in the whole plan. It is she who keeps constant supervision over these infants in the home. She teaches the mother the proper technic of the care of these infants; keeps the mother in contact with the physician, sees to it that the necessary set-up for the care of the baby is provided; works with the private physician if he has expressed a desire to have her continue on the case. A good nurse is the one feature for which there is no substitute; makeshift nursing would probably be worse than no nursing.

The aim of this discussion has been to sketch in the broadest strokes the means that have been used in a large metropolitan community to solve a problem in infant care. It is an effort to bring to all premature babies the same chance of living as has been given to a selected few that were fortunate enough to have been born in well equipped institutions or to have been taken there soon after birth. Perhaps the highly refined procedure of institutional care cannot be brought to every baby in all sorts of homes; however, since this care is a matter of carrying out certain principles rather than the application of an elaborate technic through complicated appliances, it is felt that the program has certain general interest to all physicians. It is understanding and not apparatus that counts. I believe that all we have done could be carried out in any community no matter how primitive.

## THE CLASSIFICATION OF POISONING WITH METHODS OF DIAGNOSIS AND TREATMENT OF SOME OF THE MORE COMMON POISONS

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A poison may be defined as a substance which, when introduced into the body, or absorbed into the blood, is capable by chemical action to affect health or destroy life, and this is its usual effect. A substance which is ordinarily not a poison may become poisonous after the above conditions have been fulfilled. There are various conditions which may modify the action of a poison:

1. Solubility of the substance in water, acids, and also in body fluids, and particularly in lipoids.
2. The rate of absorption, which in turn depends upon a series of factors, such as diffusibility of the substance, its physico-chemical properties, conditions favoring solution or diffusion and systemic conditions.
3. Portal of Entry. Absorption through the stomach is slow, whereas absorption through the respiratory tract occurs much faster. The skin can also absorb poison very rapidly. The author, for instance, has killed rabbits by rubbing wood alcohol to a shaved area on their backs. The genitourinary tract has also been a frequent place of absorption of poisons.
4. Concentration of the poison.
5. The rate of elimination.
6. Individual susceptibility which may be subdivided into an increased susceptibility or idiosyncrasy and a decreased susceptibility, or tolerance.

There are various classifications of poisonings which have been offered, none of them being satisfactory. Poisonings have been classified for statistical purposes as homicidal, suicidal, accidental and undetermined, or they may be classified as to duration, as acute, subacute and chronic, or as to their action as corrosives, irritants and neurotics. In this present paper the author has attempted to classify poisonings according to the conditions under which they occur.

*I. Intentional Poisonings.* This group in-



cludes primarily cases of suicides. Several substances have been chosen by the public at large for suicidal purposes and poisons of choice are those which are easily obtainable and cheap, and believed to be effective.

In this country carbon monoxide poisoning is quite common. The poisonous gas is usually inhaled from fuel gas supplied to the home or from the exhaust of an automobile in the garage. The gas escapes from the exhaust while the motor is running. In 1935, 46 out of 74 carbon monoxide poisonings in Cook County, Illinois, were due to automobile exhaust gas.

Other poisons which have been used with suicidal intent are bichloride of mercury, carbolic acid, quinine, potassium cyanide, oxalic acid, mineral acids and alkalies, sodium fluoride, and strychnine.

The group of intentional poisonings includes also homicidal poisonings. The most common poisons used for this purpose are arsenic and strychnine. The four most important motives for homicide are financial gain, love or passion, hatred and revenge. Murder by poison is still being resorted to in spite of the great progress in toxicological investigation. Arsenic is commonly given in divided doses, or may be used in smaller doses over a longer period of time and then one large dose administered to hasten the end. The Baker case may be given as an illustration. In this case the arsenic was administered over a period of six weeks, then finally one large dose was given which caused Baker's death.

In this subgroup belong also cases of infliction of injury. Sulphuric acid is used comparatively often in passional crimes for the purpose of marring.

Poisonings have also occurred in cases of criminal abortion, where the poison had been either procured or administered by some other person. Several substances have been used as abortifacients. The most common ones being quinine, ergot and cotton-root bark. In certain small communities in Germany, drastic substances such as sulphuric acid have been used. Other substances used for the same purpose are apiol capsules, certain lead compounds, nitrobenzol, potassium chlorate, thuja, oil of savin, and oleandrum leaves.

2. *Unintentional Poisoning.* These poisonings are due most commonly to the exposure of work-

men to noxious substances and gases. They may be considered accidental, yet the manufacturer is held liable under the "Workmen's Occupational Diseases Act." The discussion of this rather practical phase of the subject would occupy more space than the author intends to devote to this paper, therefore only a few of the most important types of poisonings shall be mentioned. These include in the order of their importance the following:

Lead poisoning has been known for centuries, even by the early Greek and Roman physicians, and it was Hippocrates who first incriminated lead as the cause of certain symptoms. Industrially, lead poisoning occurs chiefly in the manufacture of lead pigments, battery plates, painting, plumbing, printing trades, glazing china and porcelain ware, covering cables, bearing metals, smelting and refining of lead, and in any industry that uses lead in the process of its manufacture. Poisonings are also frequent in automobile industry, where solder is used on automobile bodies. In this connection, it is interesting to mention that the negro race seems to be more susceptible to lead poisoning than the white race.

Cadmium is a metal which also has industrial-toxicological importance. Industrially, the greatest danger of cadmium poisoning is found in the manufacture of this metal and in the handling of its compounds. The workman is usually exposed to the fumes and vapors which escape from the condensers of the blue powder furnaces, in the making of cadmium and cadmium oxide. This poison enters the body most commonly through the gastrointestinal tract. Three cases of poisoning have been reported in workers in paint factories, where ingots of cadmium were melted. (Legge, T. M., Ann. Rep. Chief Inspect. Factories, 1923; London, 74: 1924.)

Chromium is also of importance as an industrial poison. It is now being used extensively in plating of metalware. The chromates of sodium, potassium and ammonium are used as mordants in dyeing and in the quick method of tanning leather. Chromates are used in the manufacture of paper, wall paper, aniline dyes, explosives, electric batteries, artificial flowers, bleaching oils and fats, textile printing and in paints. Potassium bichromate is used in the manufacture of battery fluids. The derivatives of chromic acid

are decidedly toxic and a series of severe poisonings with fatal outcomes have been reported. Dichromate solution when brought in contact with the skin gives rise to an ulcerative dermatitis and this can be observed generally among photographers and blue print makers. In the plating industry, perforation of the nasal septum may occur.

Chronic manganese poisoning is much more common than had been thought in the past. The author recently presented a case with a review of the literature of industrial manganese poisoning. (McNally, W. D., *Industrial Medicine*, 4:581, 1935.) It occurs in brown ore millers who are handling manganiferous ores and are exposed to manganese dioxide dust. At present, it is most frequently observed among workers in the dry battery cell industry. The clinical picture bears much resemblance to Parkinsonism, and includes disturbances in gait, mask-like stolid face, speech disturbances and tremors. Up to the present time there have been reported altogether 142 cases of chronic manganese poisoning in the literature.

Industrial arsenical poisoning is of a certain importance inasmuch as arsenic trioxide is used to decolorize clarified glass, for the bronzing of metals and in the form of lead arsenite for the preparation of white enamel. It is also used for the preservation of skins, furs, and rugs. Sodium arsenite and other arsenical preparations are used as mordants in cotton printing; in the manufacture of various insecticides, such as Schweinfurt's green, and lead arsenate.

Arsine intoxication is of a relatively frequent occurrence. This gas is often present in air as a result of the action of acids upon metals such as iron, zinc, copper and cadmium containing arsenic. The author has found it in air during the pickling of iron and steel. Multiple neuritis has been reported from the inhalation of this poisonous gas generated in this process. Cases of arsine poisoning having been reported comparatively often in the production of zinc salts, and in chemical factories from the cleaning of the acid residue in tanks. The gas has a strong hemolytic action and jaundice usually develops in the victims from the formation of an excess of bile pigment, from the liberated hemoglobin.

Cyanides are used extensively by photographers and electroplaters. They are easily obtained

by the laity. Poisonings have been reported from its indiscriminate use in the cleaning of silverware.

Space will not permit to discuss in detail all of the types of industrial poisons. Only the most important ones shall be briefly mentioned here. These include carbon monoxide, hydrogen sulphide, sulphur dioxide and ammonia and mercury poisoning.

Among the organic solvents of industrial-toxicological importance are benzol, toluol, xylol, benzine, methyl alcohol and some of its homologues, particularly butyl alcohol, carbon tetrachloride, trichlorethylene, butyl acetate, and a host of other less known organic solvents.

The fluorides present in minerals and ores are also important because of their chemical interaction with silica in producing fibrotic changes in the lung. (McNally, Wm. D., *J. Ind. Hyg.*, 1935.)

*Home Poisoning.* This group includes poisonings which occur in the home as the result of a mistake, carelessness or ignorance. Oxalic acid poisoning oftentimes results from the ingestion of the contents of unlabeled or erroneously labeled bottles. Accidents have occurred in homes where bottles containing oxalic acid have remained unlabeled after some of it had been used for the removal of ink stains from linen. Oxalic acid is easily confused with Epsom salts, to which it bears a close resemblance.

Several cases of poisoning have also been recorded as the result of carelessness in handling and disposing of medicinals. Children may inadvertently swallow with fatal results substances such as Hinkle pills, mistaking them for candy.

Decoctions of tobacco are sometimes used as insecticides in the country. These decoctions are oftentimes kept carelessly in unlabeled whiskey bottles and may be ingested by accident. Acute nicotine poisoning results and death occurs very rapidly.

In homes, carbon monoxide is generated as the result of incomplete combustion in defective stoves. Other sources are low burning oil lamps, Bunsen burners, etc. The Bunsen burner is particularly dangerous because it may ignite at the base whereby considerable quantities of the poisonous gas are produced. Stove pipes passing through the walls may be leaking and cause carbon monoxide poisoning in a room at some distance from the source. In the past, carbon



monoxide intoxications due to illuminating gas had been very frequent, but the number of deaths in the last few years has been steadily diminishing, due in part to the substitution of electricity as a means of illumination, and also to the use of service gas which at present contains only 3% carbon monoxide. Exposure to an atmosphere contaminated with this gas may cause serious illness. If the concentration of the carbon monoxide is as low as 0.1%, headache and vomiting result in a few hours. Carbon monoxide may act very rapidly and cases have been reported in which the victim after a single breath of air containing a high concentration of the gas fell suddenly backward as though struck by lightning. In the majority of cases, victims of carbon monoxide poisoning in the home are either found dead or die shortly after discovery.

Another source of poisoning in the home is the refrigerating gas, and the danger increases rapidly in proportion to the amount of the chemical used and the manner in which it is distributed. The three most important refrigerating gases are sulphur dioxide, methyl chloride and ammonia. Poisoning by methyl chloride is listed in text-books of toxicology as being rare, but the author has observed 98 cases. On August 10, 1928, I saw the first case of methyl chloride poisoning in which three people lost their lives. The first symptoms are drowsiness, nausea, vomiting, headache and a feeling of fatigue. There may be some dyspnea and a transitory diminution of vision. The blood picture nearly always shows a condition suggestive of primary anemia.

There is little danger from sulphur dioxide poisoning because the gas is so irritating to the respiratory passages that the victim usually becomes aware at once of its presence. Death from asphyxia results only when the concentration is very high and the victim cannot retire from the fumes fast enough.

Ammonia is used often in large refrigerating units. If the concentration of the escaping gas is very high death may occur in a few minutes. The result is a general vasoconstriction and a tachypnea. Respiration may stop suddenly. In the home ammonia water is often used for cleaning purposes. Accidental and suicidal cases have been reported from the drinking of ammonia water.

In the past few years of depression discarded storage battery casings have been used in homes for fuel. The inhalation of lead fumes derived from this material has given rise to a number of poisonings. In November, 1935, several children of one family were brought to the Cook County Hospital. Two children died of an encephalitis in spite of an attempted subtemporal decompression. The casings used had been obtained either at a very low cost from the junk dealer or were found discarded.

Lead poisoning in homes has also occurred in connection with drinking water. In newly constructed houses the lead content of drinking water may amount to 5.3 mg. per liter in the morning, and 3.5 mg. per liter during the day. Fairley (Fairley, K. D.: *Med. Jour. of Australia*, 1: 600, 1934) has observed cases of poisoning occurring in infants who were poisoned from the use of toilet water containing lead. A number of lead poisoning cases occur also in small infants who chew on the framework of their cribs, and from toys and wood-work painted with lead-containing paints. Infants also have been poisoned by lead-containing face powder used by the nursing mothers. The usual symptoms in such cases were delayed teething, nervous symptoms such as convulsions, twitching and paralysis, diarrhea and constipation. Blood smears show the presence of basophilic stippling.

Cases of lead poisoning have been reported in the homes as the result of the ingestion of lead arsenate used commonly as an insecticide. Several cases of arsenic intoxication in the home have occurred from the ingestion of Paris green.

Another common source of home poisoning are the fluorides and silicofluorides which are commonly used as roach powders. The symptoms are vomiting, diarrhea, salivation, labored breathing, spasms, cyanosis and a small rapid pulse. Death usually occurs within eight hours.

Other poisonings include those which result from the indiscriminate use of hypnotics of the barbituric acid series (veronal, luminal, amytal, etc.).

A number of deaths have been traced to various solvents used in the home such as benzol, benzene carbon tetrachloride, trichlorethylene, naphtha, etc.

Sporadic cases of botulinus infection still occur in connection with the ingestion of improperly canned food. *B. botulinus* is a spore

forming anaerobic bacillus which produces a highly poisonous toxin. It has been responsible for a number of cases of food poisoning.

Occasionally there occur poisonings in the home as the result of the ingestion of bichloride of mercury tablets and other mercurial preparations which are taken either through carelessness or by mistake.

Home poisoning may result also from the ingestion by children, of thorn apples (*stramonium*) or from the ingestion of mushrooms which have been picked in the fields or woods and were believed to be non-poisonous. Many cases of dermatitis occur from the use of cosmetics (face powders, eyebrow pencils, lotions) to which the patient may be particularly sensitized. Cases of dermatitis result also from furs which have been freshly dyed and from flowers, especially from primroses. A few cases of thallium poisoning have been observed from its use as a depilatory.

*Medicinal Poisoning.* Medicinal poisoning may be due chiefly to three causes: 1. To errors occurring in the physician's prescription. 2. To errors arising during the filling of a prescription. 3. To indiscriminate self-medication. The following example may be given: A physician's erroneous prescription read soluble barium instead of insoluble barium for x-ray examination; the same mistake was made by the pharmacist who filled this prescription. Again, physicians may erroneously prescribe alkalies with alkaloidal salts causing a precipitate of the alkaloid, which might be taken in the last dose of the bottle, with fatal consequences. Mistakes may also occur by prescribing an overdose. Cases have occurred in which the physician prescribed 1/20 grain of aconitine instead of 1/400 grain. Oftentimes poisonings result from careless and inaccurate directions to the patient. Arsenicals taken in this manner over a long period of time have given rise to polyneuritis, exfoliative dermatitis and other skin lesions. Mistakes on the part of the pharmacist may occur as in the case cited above. A well known pharmacy three years ago dispensed by mistake mercuric chloride in place of calomel. On the part of the patient poisoning may occur following the indiscriminate use of drugs which the patient sometimes procures himself, and in a large number of cases the patient in order to obtain quicker and better results consumes larger doses of medicine than

those prescribed by the physician. Self-medication is very common, particularly in reference to women who want to lose weight. They use substances such as dinitrophenol and thyroid extract. Sometimes similar substances are procured either by incompetent third persons or through advertisement in non-official publications. Several cases have been reported by the indiscriminate use of oil of chenopodium, carbon tetrachloride, santonin and other anthelmintics. A number of persons suffering from gout have poisoned themselves inadvertently with atophan which has given rise to fatal hepatitis. Poisonings also occur from self-medication in the treatment of lues, with arsenic, mercury and antimony. Mercurial poisonings have often resulted in connection with amalgam fillings of teeth. Poisonings with thallium or barium used as a depilatory or in the treatment of mycoses have been relatively frequent. Iodide poisonings have resulted in connection with its use as a contrast substance in bronchography.

Nervous persons suffering from worry and insomnia have often been the victims of barbituric acid derivatives, of which they had taken an overdose in order to secure more rest.

There is finally a group of poisonings which occur as the result of individual susceptibility to drugs, such as antipyrine, arsphenamine, iodine, salicylic acid, potassium chlorate and amidopyrine. Under this heading the author will also include those cases of chronic poisonings which result from medicinal use. Morphine, cocaine, trichlorethylene, chloral hydrate, chloroform, alcohol and a few other substances are known to bring about a craving in persons who overindulge in their use. Morphine, cocaine and alcohol are particularly apt to give rise to addiction.

Morphine is usually taken hypodermically by the addict. The effects of the prolonged use of any of these drugs are characterized by a complete breakdown of moral, mental and physical character of the addict. In cocaine addiction, the individual usually snuffs a small amount of the crystals. This is known to the addict as "snow." At first, the effect is generally that of elation and increased physical strength. The habitue develops an idea of grandeur, but with the prolonged use of this alkaloid, as time goes on, he deteriorates mentally.

Having presented this classification of the



most common poisons as they have presented themselves to the toxicologist, the author desires to discuss the diagnosis and treatment of some of the more common poisons.

The diagnosis of poisons is many times easy, sometimes difficult and occasionally impossible, with the facilities at our disposal. A proper diagnosis is of the utmost importance so that appropriate treatment may be instituted. According to Zangger (Zangger, H., *Diagnostische und therapeutische Irrtumer und deren Verhütung*. Leipzig, 1924) 80% of all cases of poisoning are not diagnosed in medical practice. This figure, I believe, is too high for American physicians. Nevertheless, there is room for great improvement in our percentage of accurate diagnosis.

Why is it impossible to make a diagnosis in every case? First, because there are too many new drugs and chemicals introduced each year to our long and over burdened list of therapeutic measures. It is impossible for us because of lack of time and training to study the pharmacology and therapeutic action of these drugs and to acquaint ourselves with the possible toxic action. However, it is possible knowing the chemical composition of some of the members of a certain group to prophesy what the physiological action probably will be for new compounds of that group. From the study of barbital (diethylbarbituric acid) we can tell with reasonable certainty how to treat the toxic action of the new compounds that are formed upon the barbituric acid base. Space will not permit a discussion of the relation between the chemical constitution and toxicological action.

Secondly, the task of diagnosis is made difficult because of the paucity of the knowledge of poisons among doctors. This lack of information regarding poisons is in part due to the failure of the medical colleges to lay more stress upon the teaching of materia medica and toxicology. In arriving at a diagnosis of poisoning the careful history is a prerequisite as in the diagnosis of disease. A history may be given which is entirely misleading. Several years ago a physician asked me to see, in consultation, a case of alcoholism, which on investigation turned out to be a famous case of arsenical poisoning.

A suspicion of an acute poisoning should be entertained if any individual who had been previously in good health suddenly become ill with

the symptoms rapidly increasing in severity. This suspicion always become increased if the symptoms appeared a short time after partaking of food, drink, or medicine. If the symptoms agree with those of a group of poisons and can be differentiated from a disease our suspicion becomes firmly fixed. However, it must be kept in mind that certain diseases closely simulate certain poisons. The irritant poisons may be simulated by gastroenteritis, gastric and intestinal ulcers, acute indigestion, appendicitis, intestinal obstruction and peritonitis. Narcotic poisonings may be simulated by epilepsy, apoplexy, cerebral hemorrhage, certain heart diseases, inflammation of the cerebral spinal system, uremia, etc. In acute poisoning a careful examination will many times enable a physician to make an immediate diagnosis. The color of the face, if of a deep pink or red, would lead one to suspect the presence of carbon monoxide or cyanide. Evidence of corrosion on the lips, tongue, mouth and throat would lead one to suspect that a corrosive poison had been taken. The odor of the breath will oftentimes give important clues, showing that cyanide, phenols, alcohol, chloroform and other odoriferous substances have been taken.

The examination of the vomitus will often reveal important evidence. It will sometimes show whole pills, tablets, parts of powder, crystalline substances, and the odor will reveal substances such as nitrobenzene, cyanide, lysol, phenol; the color will indicate whether Paris green or Rough-on-Rats had been taken. The vomitus, urine and feces should always be saved in a suspected poisoning for a chemical examination as the case may be of such a character as to be presented before a jury. The examination of the urine (Kobert, R.: *Kompendium der Toxikologie*: 1912-34\*) will frequently aid in the diagnosis. A few urinary findings are given in Table 1.

When one's suspicion has been confirmed of an acute case of poisoning one should look around for sources of that poisoning. A glass may have been left on a dresser containing remnants of poison, tablets, pills, or powders, which may give one a clue as to what had been taken. Smell of any suspected substance with care; taste cautiously of a very minute particle of the suspected substance.

The only way to be certain of the diagnosis

TABLE 1

1. Reaction very acid.	Mineral acids, acid metallic salts.
2. Reaction strongly alkaline.	Corrosive alkali, sodium carbonate, salts of organic acids (except oxalic acid).
3. Violet odor.	Turpentine and other ethereal oils.
4. Garlic odor.	Tellurium or bismuth preparations containing tellurium.
5. Odor of ammonia.	Catarrh of the bladder poisoning through strong bases.
6. Yellow to deep red.	Picrates, picric acid, selenium, pyridium, acriflavin.
7. Red in color after addition of sodium hydroxide (to be free of blood pigments)	Phenolphthalein, senna leaves, cascara, sagra, hematoxylin, fuchsin, pyraminol, and antipyrine.
8. Port wine color through hematoporphyrine.	Sulphonol, trional, chronic lead, tetronal.
9. Urine contains conjugated sulphates.	Phenol, creosol, lysol, resorcin, creosote, guaiacol, aniline, paramidophenol, acetanilid, phenacetine.
10. Urine contains leucin and tyrosin.	Phosphorus, acute yellow atrophy of liver, pellagra.
11. Small drop of urine causing tetanus in frog or small mouse.	Strychnine.
12. A small drop of urine in cat's eye causing dilation of pupil.	Atropine, hyposcyamine, scopolamine, cocaine, tropacocaine.

is to have a chemical examination made of the vomitus, medicine or food. For most of the poisons this would take considerable time. In the case of arsenic and mercury we have the quick and reliable Reinsch test.

The Reinsch test is simple and can be run in any physician's office where gas is available. The test consists in boiling a sample of the vomitus, urine, stool or suspected food in a beaker or evaporating dish with a strip of copper foil,  $1\frac{1}{4}$  inches long by  $\frac{1}{8}$  inch wide and 25 cc. of C. P. hydrochloric acid. If the material is solid, water must be added to liquefy the specimen under examination. In the case of urine, 500 cc. at least must be evaporated down to 75 cc.; usually about one ounce of solid material is sufficient. After boiling, the supernatant liquid is decanted, the foil washed with water, alcohol and ether and placed in the long end of a prepared small glass tube as shown in the illustration:

This glass tube is made from a piece of tubing  $\frac{3}{8}$  by 6 inches long. Capillary constriction is drawn so that the long portion of the tube is  $3\frac{1}{2}$  inches, the capillary about  $\frac{3}{4}$  of an inch in length, and the short end of the tube is  $1\frac{1}{2}$  to 2 inches. The copper foil is placed in the long arm of the tube, and capillary refrigerated by a strip of filter paper dipped in cold water. The finger tip is held over the opening in the long portion of the tube and heat applied beneath the copper strip. Arsenic is deposited

as octahedral crystals. Mercury is deposited as small silvery globules which can be easily seen under the microscope. Controls can be run with known specimens of arsenic and mercury.

Every type of poisoning requires a specific treatment. However, as this particular poison may not have been identified at the time of the examination of the patient, certain general rules can be followed in the treatment. These are 1. removal of the poison, 2. administration of antidotes, 3. symptomatic treatment.

1st. Wash out the stomach with plain water or with water containing one teaspoonful of baking soda to the pint unless an alkali had been taken. If a stomach pump is not handy give copper sulphate gr. V or zinc sulphate gr. XV or a hypodermic of  $1/10$  gr. of apomorphine.

2nd. Removal of poisons by enema.

3rd. Immobilize the parts by tourniquet as in bites of snakes or animals to prevent absorption.

4th. Shaeffer method of resuscitation when respiration is failing or if in hospital give oxygen with 5% carbon dioxide.

5th. Intubation or tracheotomy where unable to swallow or breathe as in case of acids, alkali or bichloride of mercury.

6th. Cold compresses to head and sponging of body until temperature is normal.

7th. Induction of sweating tends to remove some poisons.



Fig 1. McNally tube for Reinsch test.



8th. Passive massage of limbs to improve circulation.

9th. Give gelatinous drinks in cases of alkali poisoning.

10th. Pieces of ice to hold in mouth in alkali poisoning.

11th. Catheterize urinary bladder in case of morphine poisoning to prevent reabsorption of the alkaloid and also for chemical examination.

12th. Dilution of poison in the blood by hypodermoclysis using Fisher's solution or normal saline.

In case the poison is known give the appropriate antidote; otherwise use a general antidote composed of magnesium oxide two parts, and one part each of activated charcoal, tannic acid and alcresta (purified Fuller's earth). The mixture may be given in doses of a heaping teaspoonful stirred up with water or milk and can be repeated several times if necessary. The stomach should be washed out after each dose.

The treatment of poisoning may be briefly summarized by stating that the first step should be the removal of the poison from the stomach. Secondly, administration of appropriate chemical or mechanical antidotes. Under the chemical antidote we usually have another chemical either neutralizing the first poison or detoxifying it by forming an insoluble compound. Thus in the case of a corrosive alkali we would neutralize the effect of the alkali by adding a weak acid such as vinegar or lemon juice.

Use caution in the selection of an antidote. It should be nearly harmless so that if given in excess will do little or no damage. (Peterson, Haines, Webster, 2: 31, 1923.) The weak acids mentioned would be preferable to using sulphuric acid. If a soluble barium salt had been taken we would render it insoluble by the administration of a soluble sulphate as magnesium sulphate to precipitate the harmless barium sulphate.

Under mechanical antidotes are those substances that reduce the absorption of the poison by enveloping it with a coating of oil or fat or the whites of eggs. The stomach walls covered by the administration of any of these substances also prevent the absorption of the poison until removed. The effects of the poison can be altered by the use of "physiological antidotes," as in the treatment of strychnine poisoning, by the

use of chloral hydrate, chloroform, or barbiturates.

The poison can be eliminated by the use of diuretics, cathartics, enemas, and hot packs. Many poisons are eliminated through the kidneys and large drafts of water should be administered after the removal of the poison from the stomach, and potassium acetate, caffeine, digitalis, theobromine, or other diuretics administered unless contraindicated. Hot packs over the abdomen and over the region of the kidneys will increase their activity when they are congested by the poison. If the patient is unable to void naturally, the bladder should be emptied by a catheter. As most cathartics are too slow in action, the bowel should be emptied by means of soap suds enemas or plain water. In certain poisons it will be found of value to increase the activity of the skin by the use of a hypodermic injection of pilocarpin.

By the dilution of the poison in the blood and favoring the action of the organs, elimination can be accomplished by the hypodermic injection of normal salt solution (hypodermoclysis) into the breast. Where it is not possible to set up an apparatus for hypodermoclysis, a saline solution can be administered as a retention enema in the lower bowel (enteroclysis).

Where there is considerable pain anodynes can be administered. In cardiac trouble give strychnine, digitalis, camphorated oil, caffeine and caffeine sodiobenzoate. Chloral or chloroform can be given to control convulsions if they are not due to methyl chloride or to other poisons of this series. Patients should be given the best nursing service possible and visitors kept out of the room until all danger is past. Electric pads and hot water bottles may be applied to the body or the extremities in case of coldness or chills.

In the space allotted to this article it is possible to take into consideration only a few of the common poisons. The first one the author will take up is carbon monoxide.

#### CARBON MONOXIDE

Carbon monoxide is one of the most important poisons associated with human life and industry. The death rate of this poison is exceeded by only one other poison, grain alcohol. As carbon monoxide is the result of the incomplete combustion of carbon, man came in con-

tact with the most subtle of poisons with the kindling of his first fire. The effects of carbon monoxide were known in antiquity. Some of the symptoms of carbon monoxide were known nearly 300 years B. C., as Aristotle observed that "men suffered from heaviness of the head and often die from coal gas." Most of the deaths in recent years have been due largely to the more extended use of artificial gas as a source of heat and power, also to the rapidly increasing use of the internal combustion engine whose exhaust always contains carbon monoxide. In localities where natural gas is being used with a small amount of other gas, the carbon monoxide content of the commercial gas has been reduced to about 3 per cent. This, as noted in the table below, has caused a steady drop in deaths in the last two years.

TABLE 2

DEATHS DUE TO CARBON MONOXIDE IN  
COOK COUNTY, ILLINOIS

1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
470	479	518	386	237	214	361	412	320	403	375
1928	1929	1930	1931	1932	1933	1934	1935			
398	237	310	304	188	128	143	74			

Carbon monoxide when pure is nearly insoluble in water, colorless, tasteless and a practically odorless gas, this latter physical property making it dangerous as a source of poisoning. The density compared to air is 0.967.<sup>2</sup> It can be compressed into liquid and a solid. It has a coefficient of solubility of 0.0243 at 15° C.

Carbon monoxide is produced at the electrodes or from the charges of electric furnaces. In electric furnaces having limestone linings the carbon dioxide is reduced to carbon monoxide at the heated electrodes; the gas escapes unburned, producing characteristic symptoms. The most common sources of carbon monoxide, with the exception of its marked formation during a severe lightning storm, are stoves, grates, salamanders, domestic and industrial furnaces, distillation of oil, gas engines, fumes from explosions, burning x-ray films, smouldering ashes, and mine coal, natural and artificial gases. It is formed whenever incomplete combustion of carbon occurs, such as flames on besooted surfaces and low burning oil lamps. Using intermittent aspirator to imitate the smoking of tobacco, I found that the carbon monoxide from the in-

haled smoke from cigarettes was from 0.1 to 0.26% of the tobacco and paper consumed, from cigars 0.027 to 0.15% and from pipe tobacco 0.27%.<sup>3</sup>

The greatest percentage of carbon monoxide asphyxiation is through the medium of illuminating gas, which has the characteristic odor of the hydrocarbons accompanying the gas. This familiar odor does not prevent many accidental poisonings as the odor may not be perceived by those in deep sleep, or by a person with a defective sense of smell.

Carbon monoxide may be freely respired as its presence in air is not manifested by either irritation to the air passages or by its affecting the sense of smell as is noted with sulphur dioxide gas used in mechanical refrigeration. However, the moment carbon monoxide comes in contact with the blood, by diffusion, it unites with the red pigment of the blood corpuscles, forming a definite compound, carbon monoxide hemoglobin exactly replacing the oxygen volume for volume. According to research of Nicloux (Nicloux: Presse Med. 25: 153, 1916, Ibid. 29: 701, 1921) one volume of carbon monoxide acts like 220 volumes of oxygen. The corpuscles are not dead. All that the blood needs is oxygen under sufficient tension to displace the carbon monoxide. Hill and Barcroft (Hill and Barcroft: Biochem. Jour., 7: 471, 1914; Ibid., 48-491) have shown that carbon monoxide enters into combination more readily when a little oxygen is present, than when it is completely absent.

Haldane (Biochem. Jour., 13: 44, 275, 1912) believes that all the effects of carbon monoxide can be referred to lack of oxygen, the symptoms increasing with the saturation of the blood. Mice were kept alive on exposure of 200 to 300 times the fatal dose of carbon monoxide in the presence of oxygen under 1 or 2 atmospheres of pressure. Haggard (Am. J. Physiol, 56: 390, 1921) maintains that there is no direct toxic action of carbon monoxide on the heart; for if respiratory failure is prevented by means of administration of 8 to 10% carbon dioxide, the CO combination with the hemoglobin may rise to an unusually high percentage without any evidence of impairment of the heart function. Death in cases of carbon monoxide asphyxia is due to the failure of respiration, of the nature of a fatal apnea vera. Haggard further states



that the lack of oxygen resulting from the formation of CO hemoglobin induces excessive breathing which in turn results in an abnormal loss of carbon dioxide followed by failure of respiration. The increasing anoxymia from this cause speedily results in the development of heart block through its various states.

Regardless of what may be the belief as to the nature of CO poisoning (McNally, W. D., Ill. M. J., 59: 383-388, 1931) whether CO causes only a simple asphyxia or is a toxic agent, it is well recognized that where carbon monoxide has been inhaled for a considerable time the damage done to the nervous tissue, especially the vital nerve centers, is very serious. Some observers declare that carbon monoxide exercises a specific action upon the nervous mechanism of the heart which has been attributed to its specificity for the nerve centers.

The period of time during which the presence of carbon monoxide may be detected in the blood does not depend alone upon the duration of the period of exposure or its intensity, but upon individual peculiarities as well. In most cases, however, the length of time during which CO may be detected depends largely upon the period of exposure.

The symptoms may simulate many other conditions. The reason for this is chiefly in the rate of absorption and the extent of the combination of the hemoglobin with the gas. When the volume of breathing is increased by muscular exertion the absorption of gas is proportionally increased. The smaller or younger the individual the quicker is the saturation of the blood by carbon monoxide. In the resting stage the volume of breathing varies between individuals as a function of the surface area of their bodies. Small individuals succumb to carbon monoxide more rapidly than large individuals, for the volume of their respiration is greater in relation to the volume of their blood. This fact is made of practical use in the examination of the air of mines when mice or canaries are carried into the vitiated air as living signals of dangerous amounts of gas. Men breathing the same atmosphere have about twenty times as long a stay in the contaminated air as the small animals before getting into a like condition, as men have one-twentieth the skin surface of the small animal per unit of body weight.

TABLE 3  
PERCENTAGE SATURATION OF THE BLOOD  
WITH CARBON MONOXIDE AND CORRE-  
SPONDING PHYSIOLOGICAL EFFECTS

Per cent of hemoglobin in combination with CO	Physiological effect
10 .....	No appreciable effect except shortness of breath on vigorous muscular exertion.
20 .....	No appreciable effect in most cases except short wind even on moderate exertion; slight headache in some cases.
30 .....	Decided headache; irritable; easily fatigued; judgment disturbed.
40-50 .....	Headache, confusion, collapse and fainting on exertion.
60-70 .....	Unconsciousness; respiratory failure and death if exposure is long continued.
80 .....	Rapidly fatal.
Over 80 .....	Immediately fatal.

The onset of symptoms may be sudden, but usually there are warning sensations as headache, throbbing of the temples, ringing in the ears, faintness, dizziness and vomiting. The face becomes red, and there is loss of memory, vertigo, fainting, anesthesia and loss of all spontaneous power of movement. The heart action is at first violent, then weak, slow and arrested. The body temperature is lowered. Recovery is sometimes rapid. As a rule, however, there is a slow return of consciousness with more or less prolonged headache and nausea. When the gas itself does not kill, apoplexy or softening of the brain may follow.

In the acute stage, a diagnosis of food poisoning, strychnine poisoning, diabetes and alcoholism has been made in cases of carbon monoxide poisoning. In fact the symptoms are so varied that a physician is reminded of disease of the brain, spinal cord, lungs, kidneys, liver and skin. As many cases have persistent vomiting, a few have convulsions, some are in a coma, a few have delirium, and 20% have glycosuria, a faulty diagnosis cannot always be criticized.

Chronic poisoning by carbon monoxide has received the attention of many observers in recent years. There is very good evidence of this form. Accumulated cases show that it is the result of being in a constantly contaminated atmosphere. The symptoms are described as an alteration in the digestion, diminished vigor, gray color of the skin, coated tongue, loss of memory, diminution of the psychic powers and occasional convulsions. The pathologic findings at autopsies have shown, in some cases, fatty degeneration; in others, pernicious anemia.

Haines, Karasek and Apfelbach (Haines, Karasek and Apfelbach: Report of (Illinois) Commission on Occupational Diseases, 89: 1911) in their investigation of the effects of carbon monoxide, found that workmen exposed frequently to the gas in metallurgical establishments, in a large majority of cases, developed a considerable increase of red corpuscles above the normal, the number in one case examined reaching 9,000,000. The amount of hemoglobin was also usually above normal. These investigators attribute the increase in red cells and hemoglobin to a protective effect on the part of the system.

*Treatment:* This consists in taking the person at once out of the poisonous atmosphere into fresh air and in inducing artificial respiration as rapidly as possible; the giving of oxygen under slight pressure, enough to distend the cheeks, and compressing the lungs, is considered one of the most efficient methods of restoring the person to life. The elimination can be hastened by the inhalation of oxygen and carbon dioxide, 5%. Methylene blue is not an antidote but has a synergistic action.

#### MERCURY

The diagnosis of acute mercurial poisoning is made easy by the use of the above mentioned Reinsch test; this test does not distinguish between the administration of mercuric and mercurous salts. Bichloride of mercury is easily obtained in the form of tablets for use as a disinfectant colored by indigo, methylene blue or other dye. There is no odor but an acrid metallic taste. It is soluble in 16 parts of cold water, and three parts of boiling water, but is far more soluble in a solution of common salt or other alkaline chlorides. A fatal poisoning has occurred in swallowing by mistake, a tablet of corrosive sublimate for one of aspirin; also from the introduction of the tablet into the vagina for the purpose of inducing abortion. Children have mistaken bichloride of mercury tablets for candy with fatal results. Another common source of acute poisoning is the swallowing of powder and tablets for the purpose of committing suicide.

*Symptoms:* When taken by mouth the symptoms usually appear within a few minutes. There is a strong metallic taste, constriction in the throat, retching and a burning sensation in the gullet and stomach. A white coating forms

at once on the shriveled lining of the mouth, the inflammation of the throat may involve the larynx, and acute swelling of the glottis may cause asphyxia. The pain in the stomach is so severe as to cause fainting. Vomiting may occur within five minutes, and later on purging and straining with bloody stools and there may be hemorrhages from the mouth, stomach and bowels. I have seen mucous patches discharged from the bowel as large as one's hand. The urine is scanty and suppressed, the temperature may be febrile or subnormal, the respiration difficult, the pulse thready and irregular. Death is preceded by collapse, unconsciousness, or convulsions. We find a decrease in the chlorine content of the blood, decrease of the alkaline reserve owing to acidosis. The blood chemistry is a valuable aid in the treatment to show the progress being made in the treatment. The normal NPN per 100 cc. of blood is 25 to 35 mg. In mercurial poisoning we see this jump from in the eighties on the third day to over 200 on the tenth day. This is a bad prognosis as the patient usually dies. However, if the non-protein-nitrogen starts to go down after the 7th day you can be sure that this patient is going to recover. The urea nitrogen normally is from 12 to 14. This may suddenly increase on the third day to 70 mg., to over 170 on the tenth day in bad cases. In fact all of the constituents, the Urea-N, Ammonia and Amino-N, Uric acid N, and Creatinine-N of the blood increase nearly double.

*Treatment:* In all cases seen within an hour the whites of two eggs in a pint of milk should be given per mouth and aspirated in five minutes. (Skimmed milk should be used as all fats dissolve mercury salts and aid in their absorption.) Before leaving the office telephone the patient and instruct him to take the milk and induce vomiting without delay or have relatives forcibly give milk in case of attempted suicide. A second portion of milk and eggs should be given, allowed to remain for ten minutes, and then pumped out. While waiting, one-half gram of sodium thiosulphate should be given intravenously, repeated in ten hours, giving thereafter two doses every twenty-four hours, for a period of four or five days. After the aspiration of the second pint of milk, wash out the stomach every four hours with a quart of water containing 8 grains of calcium sulphide. Colonic flushing of



one gallon of water should be given every eight hours, using four grains of calcium sulphide to each pint of water. This is continued until the flushings fail to show the presence of mercury.

The absorption therapy of animal or blood charcoal should be used when cases are seen early. One gram of Merck's 'Carbo Medicinalis' will bind 850 mg. of bichloride of mercury, 580 mg. of strychnine, or 40-50 mg. of phenol. Whatever treatment is instituted it calls for the intravenous injection of sodium chloride because of the chlorine impoverishment of the blood. This can be given with glucose which stimulates the secretion of urine. Rosenthal of the Public Health Service recommended the use of sodium formaldehyde sulfoxylate in intravenous injections of one gram. Wash out the stomach with a 5% sulfoxylate, using 250 cc., allowing 300 cc. of a 5% solution to remain in the stomach.

However, Brown and Kolmer were unsuccessful they report (*Jour. of Pharm. and Exper. Therap.*, Baltimore, 52: 355, 1934) in their endeavor to corroborate the results obtained by Rosenthal with sodium formaldehyde sulfoxylate in mercurial poisoning. In their experiments, using only the minimal lethal dose of mercuric chloride, they had but indifferent success in saving the rabbits with sodium formaldehyde sulfoxylate. These authors believe that the chief value of sodium formaldehyde sulfoxylate as an antidote in acute mercurial poisoning lies in its use by mouth in sufficient quantities and sufficiently early. Intravenous treatment should be used cautiously and it must be given before one hour has elapsed from the time of the ingestion of the bichloride of mercury.

#### STRYCHNINE

Strychnine poisoning occurs occasionally in children who take the colored tonic tablets and Hinkle's pills for candy. All such preparations should be prohibited from sale unless given on a prescription by a physician. If a druggist dispenses preparations like these he should mark them with a poison label. The symptoms of strychnine poisoning are familiar to you all so we will not go into the symptomatology but will remind you of the use of barbiturates in strychnine poisoning because of their anticonvulsant efficiency. Sodium amytal may be give intra-

venously. Barlow suggests fractional intravenous injections of pentobarbital, the initial dose being 1/10 of a grain of sodium pentobarbital per pound of body weight and 1/20 grain per pound body weight when convulsions reappear. Caution should be exercised when more than four injections have been given during the first two or three hours. Apomorphine can be given, 1/10 of a grain for adults, for its emetic action causes evacuation of the unabsorbed strychnine from the stomach. The stomach should be washed out with potassium permanganate solution, diluted to the color of port wine. Give chloral per rectum to control convulsions when barbiturates do not act readily. Barbiturates are not as specific as the early claims indicated.

#### SOLVENTS

Poisoning by organic solvents is not common but can be avoided by prohibiting the sale of more than a pint of the solvent to the layman. Cleaners and dyers clean clothes so reasonably that it does not pay to take a chance with solvents like carbon tetrachloride, benzol, or trichlorethylene. These are chiefly of interest to the industrial physician but poisoning occurs even in the home with these solvents.

Benzol causes an extreme leucopenia caused by aplasia of the bone marrow affecting especially the granular leucocytes. The physician must not depend on a leucopenia for the diagnosis, for in benzol poisoning we may have an extremely low red count. In one case that I saw this last June the red count was 3,500,000, the white cells 950. But occasionally the red count may run as low as 1½ million cells. The clinical picture is one of progressive anemia with fatigue, weakness, bleeding from the gums and nose, followed by rapid decline, petechial hemorrhage from the stomach, bowels and mouth. Temperature from 100 to 105 degrees, sometimes chills, with death from anoxemia and heart failure. One might confuse benzol poisoning with agranulocytic leucopenia. The lower the red count the less likely the disease to be true agranulocytosis. Von Hans Jost; (*Archiv. für Gewerbepath. und Gewerbehyg.*, 31: 491, 1932), Yant and his associates (*Jour. Ind. Hyg. and Tox.*, 18: 68, 1936) have demonstrated that there is an increase in the urine of the inorganic sulphates in the total sulphates in benzol poisoning.

*Treatment:* For the treatment of anemia it is necessary to give a transfusion of 300 to 500 cc. of blood. To strengthen the activity of the bone marrow daily injections of the various types of liver extracts may be tried. Pentnucleotide (N.N.R.) 0.7 grams intravenously and intramuscularly may stimulate bone marrow to prevent maturation arrest of white blood cells at the stem stage. However, it has failed to prevent death in one of my cases. X-ray of the large bones should be used for its stimulating effect.

#### TRICHLORETHYLENE

*Symptoms:* Entrance to the human body is usually by inhalation, although this may occur through the intact skin which will become seriously burned, followed by generalized toxic symptoms if the dose is sufficient. Trichlorethylene is closely related chemically with chloroform, and has a very similar narcotic as well as anesthetic action, 1.7 times as strong. Probably there is no cumulative action, but we do find serious chronic after-effects following acute attacks of poisoning. These may consist of anesthesia in the region supplied by the trigeminal nerve distributed over the greater part of the face and mouth. Of more consequence is atrophy of the optic nerve, leading to loss of vision. The corneal reflex of the eye may be lost.

The most dangerous medical feature of this drug is that it leads to addiction.

*Treatment:* The cardinal point in the treatment is removal from exposure. This may be most difficult in the event that the patient has become addicted to trichlorethylene.

Little or nothing can be done for the optic atrophy. Bronchitis, pneumonia and other lung irritations should be treated in the usual way. Damage to the internal organs such as the liver, spleen, and kidneys, does not respond very well to the treatment, but further progress of consequence terminates shortly after the end of exposure to the drug.

#### CARBON TETRACHLORIDE

Carbon tetrachloride (CCl<sub>4</sub>) is a liquid with an agreeable odor. It is an excellent solvent for fats, oils and many organic substances. On account of its non-inflammability it is used in industry and in the home for dry cleaning of clothes. When inhaled, it leads to an irritating cough, headache, hiccough, nausea, vomiting,

diarrhea, pain and tenderness over the liver. Jaundiced sclera are seen in the early stages.

Give calcium gluconate and saline solutions intravenously. It may be necessary to give epinephrine, caffeine sodiobenzoate, and digitalis for the cardiac involvement.

## FUNDAMENTALS OF ELECTROCARDIOGRAPHY

and the

## NORMAL ELECTROCARDIOGRAM

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To many of us the EKG still continues to be a puzzle, a collection of mysterious peaks, depressions, curves and lines cabalistically lettered PQRST. It is the purpose of this paper to do away with this mystery and to show that every peak, every depression, every curve or line is produced by a certain phase of the cardiac cycle.

First, a few words about the action current and the string galvanometer. (Fig. 1.)

PD is a strip of muscle with electrodes attached at each end and a galvanometer between these electrodes. The end P is stimulated—the active point P has a higher electrical potential than the resting point D. A current flows from P toward D in the muscle, but in the opposite direction through the electrodes. The galvanometer needle is deflected in the direction of the current through the electrodes. Let us indicate this deflection by a line directed upward from an imaginary horizontal line.

The excitation which began at P slowly spreads to D, finally the entire muscle is equally excited. D and P have the same potential, therefore there is no current flowing in the muscle and the galvanometer needle returns to rest. We will represent this change in the needle by a line directed downward.

This state, when both ends of the muscle are equally excited and when no current is flowing in either direction lasts for a fraction of a second and this is represented graphically by a horizontal line known as the isoelectric line.

Activity persists for some moments at the distal end D, while the excitation begins to subside



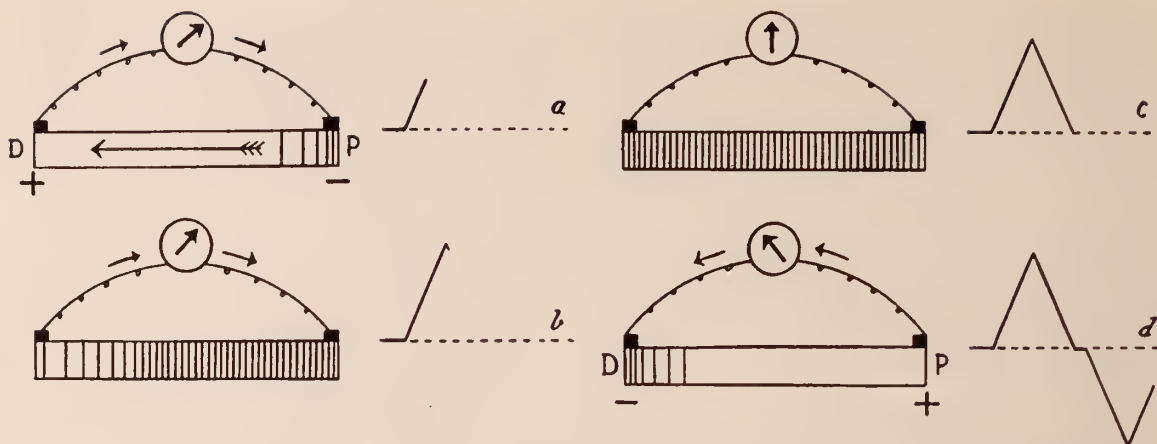


Fig. 1. A simple strip of muscle is stimulated at P. The diagram shows the resultant curve and relates its phases to the events in the muscle. (After Thomas Lewis)

at the proximal end P. D now has a higher potential, the galvanometer needle moves in the opposite direction. We will record it by a line downward.

The excitation subsides now also at D—the muscle returns to rest and so does the galvanometer needle—and we record this by a line returning upward to the isoelectric line.

The curve obtained shows the direction in which the excitation wave was traveling.

In the human heart the muscle bundles mainly run transversely, diagonally and longitudinally. It has been universally agreed therefore, to use three leads:

L. I.—Electrodes are applied to both forearms to investigate the transverse bundles.

L. II.—Electrodes are applied to the right forearm and left leg to investigate the diagonal bundles. This is the most important lead, as it corresponds to the anatomical axis of the heart.

L. III.—The electrodes are applied to the left

forearm and the left leg to investigate the longitudinal bundles.

The current generated by the action of the heart is small, negligible. In the normal heart it varies from 0.1 to 1 millivolt. To detect it we must employ a sensitive galvanometer. The Einthoven galvanometer employs a fine quartz string which is so delicate that even the heart's tiny current causes it to vibrate while passing through it. The shadows of these string vibrations are magnified and photographed giving us a permanent record, an electrocardiogram.

The EKG machine is so standardized that when the cardiac impulse is traveling from the base of the heart to its apex the resulting wave is directed upward and is called positive. When the impulse travels from the apex to the base, the resulting wave is directed downward and is called negative.

The machine is also standardized as far as the amplitude of the waves is concerned. An electromotive force of one millivolt produces a

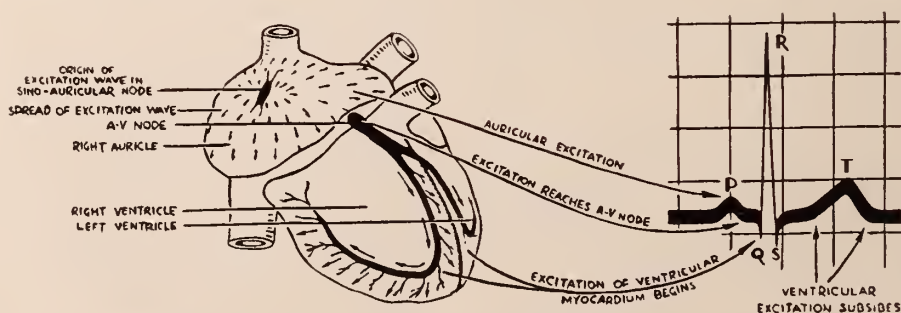


FIG. II. DIAGRAM SHOWING RELATION OF ELECTROCARDIOGRAM TO SPREAD OF EXCITATION WAVE.

deflection 10 mm. in amplitude, or  $1/10$  mv. produces a wave 1 mm. in amplitude.

With this in mind let us trace the cardiac impulse through a complete cycle from its beginning to the end in a subject who has formed a circuit with the electrocardiograph. (Fig. II.)

The impulse arises, as we all know, at the pacemaker, the S. A. node. The S. A. node is first to become active and from it the impulse spreads over the auricular musculature in concentric waves, similar to the effect produced by throwing a stone into a quiet pond. As you see the direction downward exceeds the sum total of all other directions, resulting therefore, in a positive wave named P. P then is produced by the contraction of the auricles. If both auricles contract simultaneously the P wave has the appearance of a smooth slope. Normally it is positive in all leads, but may be negative in L 3. Its duration is  $1/10$  sec. Its height varies from 1 to 3 mm. In hypertrophy of one of the auricles, as in mitral stenosis, the P wave is higher than 3 mm. becomes peaked and slurred.

For the next fraction of a second all parts of the auricles are equally contracted and no current flows in any direction. The string galvanometer is immobile resulting in an isoelectric period known as PQ or PR isoelectric interval. This interval normally varies from 0.13 to 0.20 sec. During this time the impulse passes over the AV node and the bundle of His up to its bifurcation.

As soon as the impulse begins to spread over the right and left branches of the bundle of His the interventricular septum and the attached papillary muscles become active, resulting in a negative Q wave. Q wave is absent in the EKG of frogs who have no interventricular septa. The excitation in the septum travels from the base to the apex. Therefore, Q should be positive, but in the attached papillary muscles the impulse travels in the opposite direction. Apparently the factor of the papillary muscles is greater than that of the septum. However, Q is a relatively unimportant wave and quite often absent. It is ignored usually except when it is very prominent.

From the septum the excitation continues to spread downward to the apex producing the most prominent positive peak, R. R wave should be most prominent in L 2, should not exceed 0.03 sec. in duration, and should be not less

than 5 mm. at least in one of the leads. It must appear as a smooth sudden rise and an equally smooth and sudden descent to or below the base line.

From the apex the excitation begins to spread upward to the base, producing a negative wave S, which is also a relatively unimportant wave. Within the next fraction of a second both ventricles are in a state of systole and there is no difference in potential between any two points. The string galvanometer is immobile producing the second isoelectric period known as the ST interval. This interval corresponds to the systole of the ventricles.

Within the next fraction of a second activity at the apex begins to subside, but still persists at the base. The current now flows from base down to the apex resulting in a positive wave T. This wave is important. It is prominent in young adults, and becomes less conspicuous with the advance in age. It is prominent in thyrotoxic states. When the ventricular myocardium is damaged or replaced by fibrous tissue, the T wave, particularly in Lead one and two, becomes negative. Digitalis has a tendency to invert the T wave.

Now activity begins to subside also at the base. The ventricles are in diastole. The string galvanometer remains immobile, resulting in the 3rd isoelectric line—until a new impulse arises at the S.A. node and the whole cycle repeats itself.

A normal cardiac cycle then produces a curve which consists of 5 deflections and 3 isoelectric intervals between these deflections. Every one corresponds to a certain phase of the cardiac cycle. The 1st, 3rd, and 5th deflections are positive, the 2nd and 4th are negative. Besides direction these deflections must also conform to certain limits in amplitude, duration and shape, as outlined.

The first isoelectric period corresponds to auricular systole and has a definite duration not less than 0.13 sec. and not longer than 0.20 sec.

The second isoelectric period corresponds to ventricular systole. While having no definite duration, it is, however, very important. Elevation or depression of this isoelectric period above or below the base line is undisputed evidence of disturbed coronary circulation.

The third isoelectric period corresponds to



ventricular diastole. Its duration, therefore, depends on the rate of the heart.

104 S. Michigan Ave.

## A STATEMENT TO PHYSICIANS ON THE VENEREAL DISEASE SITUATION

FRANK J. JIRKA, M.D.,

State Health Director

SPRINGFIELD, ILL.

The outlook for controlling the venereal diseases in Illinois is more promising now than at any previous time in the history of the State. An aggressive public interest in the problem has been aroused. Newspapers are encouraging with vigor a growing popular demand for an effective program. The Council of the Illinois State Medical Society has adopted a strong resolution expressing the determination of the medical profession to cooperate wholeheartedly with State and federal public health authorities in combatting these diseases. Considerable sums of money are available from the National Government *through* the State Department of Public Health for aiding municipalities and rural communities in developing and maintaining adequate and efficient programs of control. The Illinois General Assembly now sitting will be asked to appropriate approximately \$300,000 per year for the same purpose. If granted, something more than half a million dollars annually will be available from official State and National sources for the purpose of combatting venereal diseases.

In the light of this situation it seems important to invite the attention of the medical profession to the overshadowing importance of promptly reporting all cases of these diseases which come to their attention. It seems wise also to outline the proposed program which the State Department of Public Health expects to follow.

Since success in prosecuting a program depends more upon prompt and complete case reports than upon any other one factor, that point can not be emphasized too strongly. Excerpts from the regulations of the State Department of Public Health with respect to notification, which have the weight of law, read as follows:

Rule 2. Every physician, drugless healer, nurse, attendant, druggist or pharmacist, laboratory worker, dentist, superintendent, or principal directing officer of

a hospital, jail, house of correction, asylum, home or similar institution, or other person having knowledge of a known or suspected case of venereal disease or its sequelae, which is either communicable, contagious or dangerous to the public health, shall promptly report such known or suspected case to the local health authorities. In cities, towns and villages of 5,000 population or less, not having a full-time medical health officer, the physician or other person making the report may report either to the local health officer or to the Illinois Department of Public Health at Springfield. Reports of cases in such cities, towns or villages, as have a full-time medical health officer, shall be made directly to this officer.

Cases of venereal disease shall be reported on special blanks furnished to physicians by the Illinois Department of Public Health, except in cities having a population of 500,000 or over, in such cities the reports may be made on blanks or cards furnished by the local health department. Venereal diseases may be reported by key number instead of by name, except when the patient disregards the instructions of the physician.

Rule 3. Because of the confidential nature of venereal disease reports, these shall be forwarded, except as otherwise specified, on special blanks furnished by the Illinois Department of Public Health and not on postal cards. These forms must be enclosed in an envelope. Such reports shall, except as otherwise hereinafter provided, state the name, address, age, sex, color, marital status and occupation of the infected person, the name and address of employer.

They shall state the name of the disease, its duration, the name and address of the person, who is the probable source of his infection, and any other pertinent information regarding the patient, such as the nature, the date of onset and all other pertinent information concerning prior infections with any venereal disease; the names and addresses of persons he may have exposed since the beginning of this infection and any other information which might be of value in tracing and thus locating at the earliest moment, other cases of venereal disease.

(a) Upon receipt of a report of venereal disease, the local health authority shall, within twenty-four hours, forward a copy of the same to the Illinois Department of Public Health, Springfield, except in cities with an approved health department, the Director of the Illinois Department of Public Health may agree to accept daily tabulated reports and monthly and annual statistical reports from such cities.

(b) Every case of infective venereal disease shall be reported as above.

Rule 4. The correct name and address of the diseased person and the name and address of the employer of the diseased person may be omitted from the report under the following conditions:

(a) If the treatment agency or reporting agency or physician agrees in writing on a form provided for the purpose to assume responsibility that the infective case or carrier will not cohabit with or otherwise expose others.

(b) And the physician or reporting agency agrees to keep the name and address and key number in serial order in a private record book open to periodic in-

spection by the State and local health authorities but to no one else; agrees to keep records of prescriptions given and dates, treatment given and dates, and disposition of the case; states that proper instruction has been given regarding infectivity of venereal diseases; states that the patient is following all instructions regarding treatment and prevention of spread of the disease to others.

When all of these conditions have been met, the physician's report of the case to the local health authorities may state the diseased person's case or key number in lieu of his name; the name of the city, village or town, in lieu of his definite residence, and may omit the name and address of his employer.

Such reports are to be kept on file by the local health authority readily available for this purpose. One section of the file or book shall be devoted to records of each physician so reporting.

Rule 6. Upon termination of treatment of a case of venereal disease, which has been reported by case or key number, the attending physician shall report the fact to the local health authorities or to the health authority, to whom the original report was made, giving name (case or key number), the date upon which the case was terminated and upon what grounds the case was terminated (i. e., cured, transferred to another physician, lapsed treatment or died, etc.). If the diseased person lapses treatment and is still in an infectious condition, the physician shall advise such diseased person that further treatment is necessary and if no notification of transfer to another physician has been received by him after lapse of treatment within ten days, the name and address of such patient shall be reported to the local health authority or to the health authority to whom the original report was made.

It is the established policy of the State Department of Public Health to aid at all times the maintenance of ethical relations between patients and physicians. Reports will be used primarily to assist physicians in keeping patients under treatment until permanently non-infective, in making epidemiological studies to detect and dry-up sources of infection and for statistical purposes.

## STATE OF ILLINOIS

### DEPARTMENT OF PUBLIC HEALTH PERTINENT FACTS ABOUT SYPHILIS

1. More cases of syphilis are reported annually in Illinois (an average of 15,000) than of any other disease except measles and scarlet fever. There were 16,879 cases of syphilis reported in 1936, a number greater than of any other disease except scarlet fever with 22,594.

2. Only 20 per cent. of case reports are of patients in the early acute stages of the infection when cure under adequate treatment is possible, while 60 per cent. are of patients in the late stages, when cure is at best difficult.

3. Nearly two-thirds of all work done in the diagnostic laboratories of the State Department of Public Health (159,744 or 62 per cent. of 257,021 tests done in the fiscal year ended June 30, 1936) relate to syphilis.

The various local laboratories probably do in the aggregate a great many more tests for syphilis than do the State laboratories. This suggests the magnitude of the medical and allied services incurred because of syphilis.

4. About 1,000 babies congenitally infected with syphilis are born annually in Illinois. This estimate is based upon the experience of the Cooperative Clinical Group which indicates that upwards of 1 per cent. of all babies born in this country are congenitally infected.

5. At any one time there are 1,400 paresis (always due to syphilis) patients in the State hospitals for the insane in Illinois and studies indicate that about 2,700 of the inmates of these hospitals owe their condition to syphilis. On this basis, syphilis is responsible for about one-tenth of the approximately \$12,000,000 spent annually for the care of the insane in Illinois.

6. Through official and voluntary channels the public pays about \$500,000 annually for the medical care of syphilitic patients. This is in addition to expenditures through State hospitals and by private pay patients.

7. Most new infections of acquired syphilis in the male are among persons between 18 and 24 years of age, while a considerable proportion of acquired syphilis among females is contracted through marriage.

8. The late effects of untreated syphilis, occurring 10 to 30 years after infection, include general paralysis, locomotor ataxia, heart disease (a study of deaths attributed to heart disease in Washington, D. C., revealed that 12 per cent. were due to syphilis), sterility, nervous breakdown, insanity (a study of several thousand patients admitted to the Boston Psychopathic Hospital showed that 10 per cent. owed their condition to syphilis) and the congenital infection of babies.

9. Many women are innocently infected by husbands who believe themselves cured or who suffer from an unrecognized infection.

10. Blood tests of pregnant women followed by appropriate treatment initiated before the fifth month of gestation will prevent in practically all cases the birth of syphilitic babies to infected women.

11. Proper treatment will render a syphilitic person noninfective within a day or two and continued treatment will keep him so. Appropriate, adequate treatment when started early enough after acquired infection leads to a cure in practically all cases.

12. From a medical standpoint, syphilis is one of the easiest of all common diseases to control.

13. Failure in the past to recognize syphilis from a scientific instead of a social point of view has made impossible its control. If syphilis could be looked upon as simply a serious communicable disease in the same way as tuberculosis, it could be eradicated within a few years at most.

14. Syphilis is confined to no social or economic group but is found among all classes. Confidential surveys and records at the great clinics of the country provide evidence of this fact.

### PROPOSED PROGRAM

If sufficient funds are made available the State Department of Public Health proposes to inaugurate a program that will embrace the following features:



1. Distribute entirely free of local cost all drugs necessary for the proper treatment of syphilitically infected persons without regard to their ability to pay. The purpose of this is to encourage early and adequate treatment by reducing the cost to the patient.

2. Give financial assistance to municipalities for the establishment and maintenance of approved clinics for the treatment of indigent patients and for conducting efficient programs of control.

3. Enlarge the public health diagnostic laboratory facilities, State and local, so that blood tests will be available to all persons who may need the tests. This would make practicable, among other things, routine blood testing of prospective mothers by all physicians who participate in the syphilis control program.

4. Employ qualified epidemiologists to trace down the source of all infections, so far as possible.

5. Organize facilities for stimulating more complete reporting of cases, especially for early infections. Early and complete reports are essential to locating sources of infection, on the one hand, and to encourage adequate treatment, on the other.

6. Employ eminent syphologists and other specialists to conduct refresher courses in the newer methods of diagnosis and treatment for practicing physicians. County or regional meetings would be held for this purpose from time to time.

7. Conduct public educational programs. These would embrace among other things the holding of institutes from time to time in communities throughout the State.

## EFFECTIVENESS OF THE ORAL ADMINISTRATION OF EPHEDRINE IN THE

### COMMON COLD

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AND

ALEXANDER J. NEDZEL, M. D.

CHICAGO

The problem of the common cold, from whatever angle it has been attacked, has proven to be one of the most colorful in the field of science. Untold effort and stupendous sums have been expended, and while results have been obtained, yet, the future alone holds many of the answers. In dealing with any phase of this subject one has to be markedly circumspect. Statements have to be made with care and can not be too ambiguous, because the reader of reports of this

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From the Department of Bacteriology and Preventive Medicine, University of Illinois College of Medicine, and the Research Laboratories of the Illinois Department of Public Health.

Read before Section on Public Health and Hygiene, Illinois State Medical Society, Springfield, May 20, 1936.

The various combinations of Ephedrine and Amytal were prepared and furnished us through the courtesy of Eli Lilly and Company, Indianapolis, Indiana.

nature is too prone to make note of the more favorable aspects, and to accept facts as proven which, when subjected to a more careful analysis, would fall into an entirely different category. Works of this nature, if fruitful at all, unfortunately receive extensive undeserved publicity. The reading public is momentarily raised to a state of expectancy or to use the vernacular, one might say that it is built up to an awful letdown. It is not the purpose of this paper to leave any impression that we have found a cure for the common cold. The word "treatment" was purposely left out of the title, because to many, treatment suggests cure. It is our intention merely to give ample reason for undertaking the type of investigation pursued, to give reason for the employment of the chosen type of therapy, and to carefully and in detail analyze the result. The final evaluation is left entirely to those who have kindly condescended to be in attendance at this presentation and to those who possibly may subsequently peruse this report in published form.

That the common cold is a scourge to the human race both individually and collectively is well known. The employer is faced annually with the problem that during the colder months there will be absences from work by large numbers of his employees, and temporary lowered efficiency on the part of those who manage to continue in attendance in spite of their respiratory distress. The individual, and particularly he who is susceptible to colds, is faced annually with the anticipation of the period during which he may be confined to his home with his earning power reduced, or if he can continue with his daily duties, a period of marked discomfort and lessening of efficiency. The Metropolitan Life Insurance Company reported in 1923<sup>1</sup> for the common cold and associated infections a rate of 420.7 per 1000 employees, an average loss of 2.2 days per case, and a total loss during the year of 6,233 days. In 1926<sup>2</sup> the same company reported a rate of 1,345 absences annually for each 1000 employees, a loss of 45,254 working days, and an average of 3.7 days duration per case. In 1926 tonsillitis was included in the estimates and the total number of clerical workers was approximately 9,204 as compared with 6,700 in 1923.

Therefore, while it is true that there is no specific remedy for the common cold, nevertheless, any type of therapy which can shorten the

course or markedly alleviate the discomforting symptoms of such an infection for the countless number of annual sufferers, should certainly be looked upon with favor, if its efficiency can be proven with satisfaction. From time immemorial countless combinations of drugs have been prescribed and employed for this purpose. One of the most recent is the preparation of Diehl.<sup>3</sup> While his formula seems quite effective, it is definitely narcotic, and it is not unreasonable to suppose that the chief motive action of this treatment is that the patient does not care whether he has a coryza or not, having been rendered less alert to his distress by having been made somewhat "dopy." Considering that most cases of coryza may be fundamentally of an allergic nature, we decided to experiment with an ephedrine preparation which has been successfully employed in some cases of asthma, hay fever and other allergic states. Since ephedrine has a tendency to cause psychic excitation, especially insomnia, it seemed rational to combine it with a sedative such as isoamylethylbarbituric acid.\*

We first employed in combination, ephedrine sulphate 0.024 gm ( $\frac{3}{8}$  grains) and isoamylethylbarbituric acid 0.048 gm ( $\frac{3}{4}$  grains). While the results were encouraging in this first series, seven cases exhibited unpleasant reactions to the drugs such as palpitation, gastric distress and dizziness. In an attempt to eliminate such reactions the dosage in the second series was changed to ephedrine sulphate 0.008 gm ( $\frac{1}{8}$  grains) and isoamylethylbarbituric acid 0.016 gm ( $\frac{1}{4}$  grains). The results were as satisfactory as in the first series.

Two cases of palpitation occurred, but there were no cases of gastric distress or dizziness. The logical procedure to obviate the possibility of the further occurrence of palpitation as an aftermath to the intake of ephedrine was to increase the isoamylethylbarbituric acid. This was done and in the third series we employed, ephedrine sulphate 0.008 gm ( $\frac{1}{8}$  grains) and isoamylethylbarbituric acid 0.024 gm ( $\frac{3}{8}$  grains). Again the results were equally satisfactory and this time no undue drug effects were noted. On this basis, therefore, the dosage as employed in the third series is considered the one of choice. In

the first series the medication was administered every four hours, and in the second and third series every two hours, the latter being the time interval of choice. The patient was advised not to take in excess of six doses in one day and to stop the medication as soon as relief was noted.

In obtaining data for analysis the following form was used. When a subject applied for treatment he was required to fill out the first part of the form, and then he was required to return at intervals of 24, 48, and 72 hours and fill out the subsequent parts as indicated for those periods. Each form was filled out by the patient himself and is a direct expression of the effect noted by him. We felt that information obtained in such a manner is of more value than that obtained by questioning the individual and then filling out the form for him.

### QUESTIONNAIRE EMPLOYED

Date.....  
 Name .....  
 Age .....  
 Sex .....  
 Occupation .....  
 Are you subject to "colds"?.....  
 How many times during each year do you have colds?.....  
 When you have a "cold," how many days does it usually last? .....  
 What are your usual symptoms when you have a "cold"? .....

### PRESENT COMPLAINT

1. Date of onset.....
2. Local symptoms
3. General symptoms

### RESULTS OF MEDICATION

#### After 24 Hours

1. Improved or not improved?
2. If improved, state specifically what symptoms were alleviated.
3. After how many capsules did you first notice improvement?

#### After 48 Hours

(State any additional changes noted and also state whether there was additional medication.)

#### After 72 Hours

(Summarize your present condition, giving your opinion of whether the medication has shortened the course of your infection in comparison to your previous experience and how it compares with medication of other types taken by you in the past.)

The analysis of the data obtained is given in the following tables:

TABLE 1. ANALYSIS OF CASES TREATED

	Series I	Series II	Series III
Ephedrine .....	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{3}{8}$
Amytal .....	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
TOTAL CASES TREATED...	109	137	256
Improved .....	93-85%	114-83%	211-82%
Not improved .....	16-15%	23-17%	45-18%

\*Additional experimentation has convinced us that phenobarbital is as efficacious in combination with ephedrine as amytal.



<b>IMPROVED</b>			
Subject to colds.....	70	85	178
Not subject to colds.....	23	29	33
<b>SUBJECT TO COLDS</b>			
Duration less than five days	23	17	41
Duration over five days..	47	68	137
<b>NOT SUBJECT TO COLDS</b>			
Duration less than five days	11	8	8
Duration over five days...	12	21	25
<b>NOT IMPROVED</b>			
Subject to colds.....	11	17	35
Not subject to colds.....	5	6	10
<b>SUBJECT TO COLDS</b>			
Duration less than five days	2	3	8
Duration over five days...	9	14	27
<b>NOT SUBJECT TO COLDS</b>			
Duration less than five days	0	2	2
Duration over five days...	5	4	8

TABLE 2. ANALYSIS OF CONTROLS

(Capsules contained only milk sugar)

<b>TOTAL CASES</b> .....	64
Improved .....	17
Not improved .....	47
<b>IMPROVED</b>	
Subject to colds.....	16
Not subject to colds.....	1
<b>SUBJECT TO COLDS</b>	
Duration less than five days.....	10
Duration over five days.....	6
<b>NOT SUBJECT TO COLDS</b>	
Duration less than five days.....	1
<b>NOT IMPROVED</b>	
Subject to colds.....	38
Not subject to colds.....	9
<b>SUBJECT TO COLDS</b>	
Duration less than five days.....	13
Duration over five days.....	25
<b>NOT SUBJECT TO COLDS</b>	
Duration less than five days.....	3
Duration over five days.....	6

TABLE 3. AVERAGE DOSAGE

<b>FIRST GROUP (E <math>\frac{3}{8}</math> and A <math>\frac{3}{8}</math>)</b>	
Those subject to colds.....	4.8 Capsules per person
Those not subject to colds.....	5.4 Capsules per person
<b>SECOND AND THIRD GROUPS (E <math>\frac{1}{2}</math> and A <math>\frac{1}{4}</math>-<math>\frac{3}{8}</math>)</b>	
Those subject to colds.....	4.0 Capsules per person
Those not subject to colds.....	4.4 Capsules per person

TABLE 4. UNDUE EFFECTS OF MEDICATION  
EFFECTS NOTED

1. Palpitation.
2. Dizziness.
3. Nausea.

INCIDENCE OF EFFECTS

Group 1 .....	Seven cases
Group 2 .....	Two cases
Group 3 .....	No cases

TABLE 5. FINAL ANALYSIS

<b>TOTAL CASES TREATED IN THREE GROUPS 502</b>	
Improved .....	417 or 83%
Not improved .....	85 or 17%
<b>TOTAL CONTROLS</b> .....	
Improved .....	64
Not improved .....	17 or 26%
Not improved .....	47 or 74%
<b>CASES TREATED</b>	
<b>DURATION OVER FIVE DAYS</b>	
Improved .....	300 or 82%
Not improved .....	67 or 18%

**DURATION LESS THAN FIVE DAYS**

Improved .....	108 or 81%
Not improved .....	25 or 19%

**CONTROLS****DURATION OVER FIVE DAYS**

Improved .....	6 or 16%
Not improved .....	31 or 84%

**DURATION LESS THAN FIVE DAYS**

Improved .....	11 or 40%
Not improved .....	16 or 60%

While it is true that the tables of analysis are more or less self-explanatory, we would like to call attention to a few of the pertinent facts exemplified. Initially it seemed that better evaluation could be brought about relevant to improvement if the subjects were divided according to predisposing tendencies and duration of infection. This scheme has been carried out in our analytical tables and, as a result, we are able to obtain certain information which would have been inaccessible had we considered the group as a whole solely from the point of view of improvement or lack of improvement. It is noted that the majority of persons treated comprises those subject to colds, and that of these, those in which the duration is longer than five days are in excess. Those who were subject to colds seemingly responded better and required less medication than those not subject to colds. It is observed that the treated cases of duration over five days shows 82% improvement compared to 16% in the controls, and that the treated cases of duration less than five days show 81% improvement compared to 40% in the controls. This high per cent. of improvement in the controls whose duration is less than five days suggests that the group is not an indicator of response to treatment since a large number of such subjects recover without therapy. Undoubtedly the patronage of these individuals whose duration of colds is less than five days is to a great extent responsible for the existence and favorable reports on various proprietary cold remedies. We base our evaluation entirely on the response in those in whom the course of infection routinely exceeds five days. In considering the unimproved treated cases we found that in practically all cases, in addition to the coryza, there were other symptoms such as fever, cough, sore throat, laryngitis, etc. Of those unimproved treated cases having only a simple coryza, it was found that they had not reported for treatment from three to twelve days after the onset. The

best results were always obtained in patients reporting within 24 to 48 hours after the onset.

#### SUMMARY

1. A study has been made of 566 cases of acute coryza in adults during the years 1934, 1935, and 1936.

2. Of the cases studied 502 were treated and 64 were employed for controls.

3. The observations in the treated cases were concerned with the response to varying combinations of ephedrine and amylal.

4. The dosage of choice proved to be ephedrine sulphate  $\frac{1}{8}$  grain (0.008 gm) and amylal  $\frac{3}{8}$  grain (0.024 gm).

5. The optimum dosage of this drug combination is considered to be six capsules or tablets per day with an interval of two hours between each dose.

6. In every case it was advised that medication be stopped as soon as definite improvement was noted.

7. The number of doses necessary to elicit improvement varied from a minimum of one tablet or capsule to a maximum of twelve tablets or capsules with an average intake per person of from 4.0 to 4.4 tablets or capsules.

8. The most satisfactory results were obtained in those who reported for treatment within 24 hours after onset.

9. The controls were given capsules of milk sugar indistinguishable from those containing the actual medication.

10. The treated cases evidence 83% improvement as compared to 26% in the controls.

11. Inasmuch as 40% of the controls whose usual period of illness did not exceed five days improved, it is considered that the inclusion of such individuals in the final evaluation of response to therapy will result in over optimism in regard to the noted effect, and it is for this reason that we base our conclusions on that group in which the duration of illness exceeds five days.

12. Patients having fever, sore throat, cough, laryngitis and purulent nasal discharge did not respond well, and neither did those who applied for treatment later than three days after the onset.

13. From the reports of the subjects treated it may be concluded that the course of infection

was shortened and improvement was noted earlier as compared to the various types of remedy employed by these same individuals in the past.

14. On the basis of relief obtained in regard to nasal symptoms and discomfort, ephedrine taken orally is at least equally efficacious as ephedrine applied locally, and its employment is certainly easier.

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#### DISCUSSION

Dr. E. F. Pearson, Springfield: It is getting rather late and I will not attempt to read my discussion. I wrote Dr. Gowen that I thought the main thing I would consider in discussing his paper would be the question, "What is a common cold?" We see a good many people who say, "I have a cold" every time the wind changes or every time they sneeze. I think one cannot always take the patient's diagnosis and it is very difficult to make an objective diagnosis. Therefore, it is extremely arduous to evaluate the therapeutic efficacy of any treatment even in a large series.

There are a large number of people who have frequent "colds" that are not "acute coryza." These are allergic or hypersensitive manifestations to physical agents. One can catch heat as well as one can catch cold. That may sound revolutionary, but I have seen a considerable number of hypersensitive people who catch heat about as frequently as others catch cold. The individual suddenly gets overheated and promptly has a running nose. The resistance of the mucous membrane is lowered and the organisms are allowed to grow. Most people who die after heat exhaustion have early bronchopneumonia.

In the allergic type of "cold" I am quite certain ephedrine has a place because anything that tends to decrease the edema of the nasal mucous membrane will allow drainage and more rapid subsidence of catarrhal exudate.

It seems a little unreasonable that ephedrine or any other drug taken by mouth would have very much effect on a true epidemic acute coryza. Of course, if drainage is kept up, the discharge will clear up quicker.

I think this paper is an interesting addition to our knowledge concerning the therapeutics of colds and I am sure in a good many instances it is as good a thing that one can do for the patient besides bed rest.

Dr. Lloyd Arnold, Chicago: This therapy does not involve absence from classes. Most of the subjects were adult young men and women in the freshman class of the University of Illinois at Chicago.

I think the question Dr. Pearson brought up is very interesting. It is very intimately associated with our present employment of artificial air conditions in the summer time. You can catch cold or catch heat,



either one. In walking across a door threshold, going inside or outside of a room, there is sometimes a change of as much as 20° or 30° F., with unknown humidity and unknown air velocity inside and outside, complicating our whole upper respiratory adaptation to our environment. As we create the man-made environment inside of the room and God Almighty does it outside, in the summer time, the varying conditions outside and the constantly lowering conditions inside immediately enter into quite a complex field of adaptation for the upper respiratory tract, which is certainly becoming more and more acute in our problems of health.

I will not discuss the upper respiratory disturbances—I think that is a better name—that Dr. Gowen has been working with. It is upper respiratory disturbances of recurring types.

I know in our student body this form of therapy has been exceedingly popular. They maintain their standing in classes; they carry their work in a uniform manner with this form of therapy.

Dr. Gowen, in closing: I wish to thank Dr. Pearson for his participation in the discussion, and I would most certainly like to voice, at this time, the expression of my appreciation to Dr. Lloyd Arnold, whose cooperation at the University of Illinois College of Medicine made this work possible.

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## PHYSICAL THERAPY AS APPLIED TO THE EYE, EAR, NOSE AND THROAT.

JOHN S. COULTER, M.D.

CHICAGO

The Council on Physical Therapy of the American Medical Association published an article on the "Evaluation of Methods Used in Physical Therapy" by Karsner and Goldblatt.<sup>1</sup> This article states that the evaluation of a treatment is not to be measured by the opinions of the physician but rather by the facts he can demonstrate. The study of the effects of physical therapy is largely an experiment on human beings. This experiment should be conducted with all the deliberation and forethought of experiments in any line of scientific work. There are two methods suggested for this experiment—the statistical and the comparative or blind test. It is believed that every physician using a new method of physical therapy should read this article, and evaluate his results according to its suggestions.

*Eye.* The circulation of the blood is greatly reduced in any local area to which cold is applied. In the first stages of acute inflammation

such as gonorrheal ophthalmia, acute conjunctivitis, acute orbital cellulitis, in ecchymosis of the lid or subconjunctival hemorrhage cold applications often reduce the amount of swelling and relieve the pain. Gifford<sup>2</sup> warns that the cold should not be continuous due to the possibility of lowering the vitality of the cornea. Usually it should not be continued for longer than 24 to 48 hours.

Heat produces an active hyperemia with its physiologic effects. The kind and amount of heat to be applied in eye conditions has not been definitely determined. It is known that often hot moist dressings are of more value than the forms of heat producing more intense temperatures. Heating the tissues up to 102° F. causes the rate of blood flow through the capillaries to be increased, tissue metabolism to be accelerated and the rate of exchange between the blood and tissues to be increased and to reach its optimum so that the blood entering the vein contains 60-65% of its saturated value of oxygen. Above 102° F. the rate of blood flow is so rapid that the blood entering the vein simulates arterial blood and contains about 91% of its saturated value of oxygen. These facts may explain the value of the less intense forms of heat.

The penetration of the various forms of heat in the eye have been determined.<sup>3</sup> In studies of infra-red radiation, a heating pad and conventional medical diathermy applied to the eyes of narcotized dogs, it was found that the skin and superficial tissues tolerate the diathermy currents to a maximum of 600 ma., and also the infra-red radiation better than they do conduction heat from electric resistance heating pad. Therefore a greater input of energy and consequently a greater rise of temperature is produced by diathermy than by either of the other two methods and by infra-red radiation than by conduction heat from the electric heating pad. It is significant that even in the anterior zones the heating power of diathermy, within the limit of skin tolerance is greater (about 2° C) than that of infra-red radiation and much greater (about 4° C) than that of the heating pad. In spite of the superior penetrating power of contact metal electrode diathermy there is little use for it in eye conditions due to the dangers of burns. Recently short wave medical diathermy has been introduced. There is much less danger of burns and considerably more penetration but

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Read before Section on Eye, Ear, Nose and Throat, Eighty-sixth Annual Meeting, Illinois State Medical Society, Springfield, May 20, 1936.

the indications for its use are by no means well established, and there is still the possibility of burns.

The raising of body temperatures by physical agents has a definite value in certain selected severe cases of iridocyclitis,<sup>4</sup> corneal ulcer and choroiditis.<sup>5</sup> In our experience hyperpyrexia has not shown any results in optic atrophy associated with tabes dorsalis.

Hyperpyrexia should be used only in hospitals surrounded with safeguards commonly employed in a major surgical operation and given under the direction of skilled physicians and technicians. There are a number of contraindications. To subject a patient to an artificial fever of 105 or 106 F. for five hours or more is not without danger.<sup>6</sup> In our opinion short wave medical diathermy by the electromagnetic induction method is the most effective and the least dangerous of the physical methods used to produce hyperpyrexia.

Surgical diathermy is indicated in the removal of superfluous eye lashes, in the destruction of the corneal portion of a pterygium, a small chalazion on the free lid border and in retinal detachment.

Local ultraviolet radiation has a definite bactericidal effect and produces a local erythema. It is of benefit in corneal ulcer, tuberculosis of the cornea and conjunctiva herpetic lesions and blepharitis. For local use there is still some questions as to the best form of radiation. Gifford at Northwestern uses a carbon arc lamp with a filter of uviol glass and quartz lens system, and believes that the lamp has a use in a large clinic but the average ophthalmologist has little use for it in his office.

General ultraviolet radiation is of benefit in phlyctenular keratitis and in ocular conditions due to tuberculosis.

*Ear.* Heat in the form of hot wet dressings or radiant heat is of value in otitis externa, perichondritis, chondritis and suppuration of the auricle, herpes oticus, otitis media and acute mastoiditis. Beck and Guttman<sup>7</sup> state when treating otitis media the use of medical diathermy is contraindicated before the rupture of the drum and after incision it is of little benefit. For acute mastoiditis medical diathermy is mentioned only to be condemned in such conditions. For chronic otorrhea, they state, as a rule they

have seen little or no benefit follow the use of medical diathermy in spite of the enormous amount of literature dealing with the use of these agents in this condition. In the management of deafness, their opinion is that medical diathermy has caused little if any benefit in deafness due to chronic adhesive otitis media, otosclerosis or labyrinthine deafness. They state that in tinnitus aurium the use of diathermy has been attended with little success.

Surgical diathermy is useful in the early and radical removal of malignant disease of the auricle combined with irradiation with x-ray and radium.

Local ultraviolet radiation is a remedy par excellence in erysipelas of the auricle. A severe erythema dose should be given. It is also useful in a furunculosis of the external auditory meatus, in eczema of the auricle, and in pruritus of the external auditory canal. Local ultraviolet radiation due to its bactericidal effect and its stimulating effect on the skin is of definite aid in slow healing of wounds following mastoid surgery.

Local ultraviolet radiation is advocated in selected cases of chronic otorrhea. If the ultraviolet radiation can reach the bacteria it has a bactericidal effect but a thin layer of mucus or pus will filter out the ultraviolet radiation and prevent its action. Therefore we have seen little benefit follow its use in chronic otorrhea.

Local and general ultraviolet radiation according to Hollender<sup>8</sup> has its most important role in the treatment of tuberculosis of the middle ear.

Favorable reports on the use of zinc ionization in chronic otitis media have been made by many. According to Hollender<sup>8</sup> there is not available sufficient evidence on the use of ionization in otology to place it on a firm scientific basis although he believes it to be good in selected cases. Those patients who have a low grade mastoid infection, pathological adenoids, cholesteatomata, aural polyps, or a small perforation of the membrane are considered to be cases in which the treatment is contraindicated.<sup>9</sup> This method has been known for years yet it is used by only a few physicians. The reasons for this would seem to be that in a great percentage of cases it will not produce results until the indicated surgery is completed; there are many con-



traindications; at the most it is only an effective method of applying an astringent; and it requires a complicated technic.

*Nose.* Heat by means of hot moist dressings or infra-red radiation should be used locally in the treatment of furuncle of the nose. Hydrotherapy and local applications of radiant heat over the face and sinuses are of value in the treatment of an acute rhinosinusitis.

In a series of experiments to determine the heating value of various physical methods applied to sinuses Andreen and Osborne<sup>10</sup>, at our department at Northwestern University Medical School, introduced a thermocouple into the natural opening of the antrum and applied conventional diathermy, short wave diathermy by electric field (16 meter) and electromagnetic induction, infra-red radiation from a thermo-spectral water cooled lamp, the Compso-lite and the Elliott treatment. The temperature rises were insignificant in any of these methods ranging from 0.4 to 0.9 F. Shambaugh<sup>11</sup> recently gave an analysis of the pathology of chronic sinusitis that prevents spontaneous recovery. With a picture of the pathology of chronic sinusitis before us it is impossible to see the value of the most efficient methods of applying heat in these conditions, if they only give such a small rise of temperature in the antrum. This means that their effect is limited to a circulatory increase in one wall of the sinus.

Surgical diathermy is used in rhinophyma, in the intramural coagulation of the turbinates, nasal polypi and in malignant tumors of the nasal sinuses in combination with x-ray and radium.

In my experience general ultraviolet radiation prevents recurrent attacks of rhinitis, but the Council on Physical Therapy will not accept this claim as it has not been proven with controlled experiments. The local use of ultraviolet radiation in nasal or sinus conditions is limited by its inability to reach the affected area, its inability to penetrate even a small surface accumulation of pus and the fact that the dosage for the destruction of bacteria and tissue cells is nearly the same, so that the destruction of the bacteria causes some normal tissue necrosis.

There are three sources of artificial radiation—carbon arc, mercury or hot quartz and the cold quartz. Laurens<sup>12</sup> believes that if one is forced to use artificial energy instead of sunlight for

general body radiation a lamp which exhibits a continuous spectrum like the sun should be used rather than one which emits the shorter ultraviolet rays. Solar radiation rarely contains radiation with wave-lengths shorter than 3000 angstroms. The cold quartz mercury lamp emits radiation with 95% of the wavelengths less than and including 3,130 angstroms in the resonance line at 2537 angstroms which is not a spectrum like the sun.

Ionization of the nose for allergic conditions was studied by McIntyre and Osborne<sup>13</sup> at Northwestern University Medical School this year. A total of 21 cases were treated, but they feel that sufficient time has not elapsed to make a positive statement. They do feel that ionization is a valuable aid for relieving allergic nasal symptoms, but not a specific. Hollander<sup>8</sup> states that it produces a profound structural alteration of the nasal mucosa and believes that one must accept the fibrotic change in the nasal mucosa as responsible for success. Many favorable reports have been made on ionization of the nose in the treatment of hay fever and rhinitis of allergic or vasomotor origin. These reports do not emphasize the fact that the patient suffers considerable discomfort with pain and a sensation of pressure in the nose for some hours following ionization.

Schall<sup>14</sup> questions whether the effect of ionization is anything more than a cauterization of the mucous membrane. He states that Palmer in thirty cases of vasomotor rhinitis secured the same results by the local application of concentrated phenol. Ramirez<sup>15</sup> has not had success in the ionization treatment of hay fever but secured benefit in non-specific perennial vasomotor rhinitis. After reviewing the literature and with the experience of the cases at Northwestern we agree with Hurd<sup>16</sup> that the method has not been used long enough at present to determine its actual value and dangers.

*Throat.* The history of the use of many physical agents in the treatment of diseases of the ear, nose and throat is similar to that of electrocoagulation of the tonsils. A few years ago this method was sold by the manufacturers of the instruments for electrocoagulation as a simple method for any physician to use for the removal of tonsils. To-day it is known to be the most difficult and dangerous method in the hands of the unexperienced. Skillern<sup>17</sup> states that the

dangers and difficulties are in proportion to the lack of knowledge and no one who is not capable of removing tonsils by other surgical technic and meeting all complications that may arise during or after the operation should attempt their removal by electrocoagulation. It does not reduce the cost of the operation for the patient. In Savitt's<sup>18</sup> series the number of treatments varied from 12 to 26. It is not a suitable method for children and nervous patients.

Electrocoagulation has a small place in the hands of the laryngologist for cases of advanced tuberculosis, exophthalmic goiter or myocardial degeneration that must have the tonsils removed. It is an excellent method for the removal of tonsillar tags and recurrent lymphoid tissues.

The use of local and general ultraviolet radiation for tuberculosis of the pharynx or larynx is always mentioned in the literature on the subject. Actually in the Municipal Tuberculosis Sanatorium of Chicago it is not used for this purpose. This is mainly due we believe to the fact that results are only secured if the ultraviolet radiation is applied directly to the lesion. This usually requires a technic that takes considerable time of a physician and equal results can be secured by less time consuming treatment. Ultraviolet radiation cannot be satisfactorily applied to the larynx by a patient using a mirror or by a technician.

The indications for electrosurgery in throat conditions have recently been summarized by Hollander<sup>8</sup> and time will not permit their consideration here.

In conclusion it is desired to emphasize that the Council on Physical Therapy of the American Medical Association investigates apparatus used in physical therapy. For the protection of the patient and physician no machine should be used in physical therapy which has not been accepted by the Council. From time to time the Council publishes articles on the use of physical agents giving conservative views on the subject and the Secretary will always answer questions on the use of new or old physical agents in any special field.

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#### DISCUSSION

Dr. A. B. Middleton, Pontiac: I agree with everything Dr. Coulter has said. This Section is certainly fortunate to have this paper.

Dr. A. R. Hollender, Chicago. I do not quite agree with Dr. Middleton that a paper of this kind will be publicized to the extent of doing harm. If such were the case other papers would be subject to the same disposition. This paper is especially instructive because it comes from the authority of one who is not primarily a laryngologist. Dr. Coulter's views are conservative and I agree that they should be. I should like to emphasize the value of infra-red radiation. This is a form of therapy which is very valuable in rhinologic work, particularly in the acute infections. In this connection I wish to say a word about short wave diathermy. While our knowledge of the subject is still limited, I am confident that the future will bring forth revelations which will force many of us to modify our present orthodox procedures. With reference to the use of diathermy in the antrum, the experimental work of Dr. Coulter is indeed interesting. While the temperature is raised only slightly this is not an index of possible clinical results. It has been shown by various workers that there are very favorable structural changes produced by the local application of electrical heating.

Whether short wave diathermy is of value in sinus-



itis, further experimental evidence will be required to prove. In the acute cases it relieves pain and promotes drainage, but in the chronic conditions much depends on the nature of the pathologic process. The resumé which Dr. Coulter presented is indeed a rational exposition of the subject of physical therapy as applied to the ear, nose and throat.

Dr. O. B. Nugent, Chicago: I would like to say a word about the local application of ultraviolet. Failure so often results because the presence of excretions which prevents the ultraviolet ray from reaching the parts to be treated. I have been preaching this gospel for many years and this is the first time I have heard it mentioned except by myself. Recently I called on a well-known ophthalmologist in another city. He had an ultraviolet apparatus and had not been able to get good results with its use in corneal ulcers. I asked him three questions: 1. If he knew the distance he treated from; 2. If he was sure he had the corneal ulcer cleaned; 3. If he was sure of the length of the exposure; otherwise he could not expect results. He had not paid much attention to those points. I have heard from him since and he said he had revised his methods and was getting much better results, and he felt this was because he had cleaned the ulcer before starting the treatment, and paid more attention to the length of the treatment and the distance from the parts to the generator.

Dr. J. S. Coulter, Chicago (closing): I have nothing further to add except that short wave medical diathermy has more penetration than contact metal electrode diathermy but no other effect than that of heat. In spite of all the claims, short wave medical diathermy is heat; the physical effects are just from the heat produced in the body tissues.

THE ADVANTAGES AND DISADVANTAGES OF ASPIRIN AND ASPIRIN WITH CALCIUM SALTS IN THE TREATMENT OF ARTHRITIS

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*Introduction.* Eighty patients with various forms of arthritis were studied clinically from January 24, 1935, to August 1, 1935, in the arthritis division of the Mandel Clinic of the Michael Reese Hospital. Forty-six patients were followed for a period of four consecutive months. All of the patients had marked objective and subjective findings so that from the clinical point of view the results obtained from the treatment could be considered a severe test of its efficacy. Close records were kept of subjective and objec-

tive improvement, as well as of gastrointestinal and other symptoms which may have developed as a result of the medication.

*Classification of Patients.* The patients were divided into four groups depending on the type of arthritis which they had. These included hypertrophic, atrophic, mixed arthritis and gouty arthritis. The hypertrophic group included 35 patients ranging in age from 40 to 73 years, with a duration of symptoms of from six months to twenty years. The atrophic group included six cases with an age range from 26 to 48 years and duration of symptoms of from two and one-half to nineteen years. In the mixed group there were four cases ranging from 40 to 68 years with a duration of from six months to 37 years. There was but one case of gout, present in a patient 55 years of age for four years.

Practically all of the patients had disorders other than arthritis—these included the following:

TABLE 1

Diagnosis	No. of Cases
Obesity .....	3
Arteriosclerosis .....	3
Hypertension .....	7
Cardiac .....	3
Short esophagus .....	2
Erythema multiforme .....	1
Spastic colon .....	4
Peptic ulcer .....	1
Biliary tract disease.....	6
Menopause .....	3
Neurosis .....	1
Psoriasis .....	1
Senility .....	1
Varicose veins .....	3
Emphysema .....	1
Multiple sclerosis .....	1
Diabetes mellitus .....	7
Nasal sinus infection.....	1
Chronic otitis media.....	1
Pulmonary tuberculoses .....	1
Generalized pruritus .....	1

*Method of Study.* The reactions of the patients during four consecutive four week periods of medication were studied. Insofar as tolerance of the patient for the medication allowed, each period was like the preceding one in the dose of the drug employed. During the greater part of the study one tablet four times a day was administered. For the first four week period the tablet consisted of four grains of acetylsalicylic acid and two grains of calcium gluconate. During the second four week period the tablet was made up of four grains of acetylsalicylic acid and two grains of starch. For the third four week period, the tablet of aspirin and calcium gluconate was again employed, while during

From the Arthritis Unit of the Mandel Clinic of the Michael Reese Hospital. Aided by a grant from the Wodlinger Fund.

the fourth study period the tablet contained four grains of acetylsalicylic acid and one-half grain of tricalcium phosphate. This amount of tricalcium phosphate yields the same amount of calcium as was found in the calcium gluconate tablets. In some cases the dose was increased to two or even three tablets four times a day. Each patient was seen once a week, if possible. In the large majority of cases they were examined at least once every two weeks, while in a few instances they were seen only every three weeks. No other medication or treatment was used other than the preparations of aspirin and aspirin and calcium compounds. The tablets used were all of the same size and appearance, and the patients were not informed of the character of the medication nor of changes from one type to another during the four months of study.

Table 2 shows the effect obtained in the relief of pain during the four periods of study.

TABLE 2

Relief of Pain—Entire Group of 46 Patients

		Per Cent.
1. Calcium Gluconate-Aspirin		
Better	32	69.5
Same	14	30.5
Worse	0	0.0
2. Aspirin		
Better	35	76.1
Same	9	19.6
Worse	2	4.3
3. Calcium Gluconate-Aspirin		
Better	34	74
Same	9	19.6
Worse	3	6.4
4. Calcium Phosphate-Aspirin		
Better	25	54.3
Same	7	15.2
Worse	13	28.3
Inadequate Dosage	1	2.2

Tables 3, 4 and 5 show the effects obtained in the relief of pain in the hypertrophic, atrophic and mixed groups.

TABLE 3

Relief of Pain—Hypertrophic Group—35 Patients

1. Calcium Gluconate-Aspirin		
Better	25	71.5
Same	10	28.5
Worse	0	0.0
2. Aspirin		
Better	27	77.2
Same	7	20.0
Worse	1	2.8
3. Calcium Gluconate-Aspirin		
Better	25	71.5
Same	8	22.8
Worse	2	5.7
4. Calcium Phosphate-Aspirin		
Better	18	51.4
Same	6	17.3
Worse	11	31.3

TABLE 4

Relief of Pain—Atrophic Group—6 Patients

1. Calcium Gluconate-Aspirin		
Better	3	50
Same	3	50
Worse	0	0
2. Aspirin		
Better	4	66.7
Same	1	16.6
Worse	1	16.6
3. Calcium Gluconate-Aspirin		
Better	5	83.3
Same	0	0.0
Worse	1	16.6
4. Calcium Phosphate-Aspirin		
Better	3	50
Same	0	0
Worse	3	50

TABLE 5

Relief of Pain—Mixed Group—4 Cases

1. Calcium Gluconate-Aspirin		
Better	3	75
Same	1	25
Worse	0	0
2. Aspirin		
Better	3	75
Same	1	25
Worse	0	0
3. Calcium Gluconate-Aspirin		
Better	3	75
Same	1	25
Worse	0	0
4. Calcium Phosphate-Aspirin		
Better	3	75
Same	1	25
Worse	0	0

The one patient with gout showed improvement from the beginning to the end of the treatment period.

*Conclusion as to Arthritic Symptoms.* Objective improvement was noted in the form of decrease of joint swelling, tenosynovial thickening and increase in joint motion. After a period of medication during which the severity of the symptoms remained constant, cessation of medication was always followed by aggravation of the symptoms.

Medication with calcium phosphate-aspirin usually produced a decrease of improvement.

*Conclusion.* Medication with salicylates brought about definite symptomatic improvement in the majority of forty-six patients with severe arthritis treated over a period of four months.

*The Production of Gastrointestinal Distress by Salicylate Medication.* It is well known that salicylate medication produces gastrointestinal distress in a number of those in whom it is employed. It is important to know the influence of the salicylates in persons who have never



had gastrointestinal distress and in those who have definite gastrointestinal pathology.

The patients with arthritis were closely observed for the development of such symptoms as heartburn, bloating, epigastric soreness, nausea, emesis and cramps during the period of medication. In some instances such severe disturbances resulted as to cause the patients to refuse to continue with the medication—these we have listed as ultra symptoms.

Table 6 shows the number of patients in whom the gastrointestinal symptoms developed with the various forms of medication employed.

TABLE 6  
SUMMARY

	Calcium Gluconate- Aspirin	Aspirin	Calcium Gluconate- Aspirin	Calcium Phosphate- Aspirin
Heartburn .....	15	13	13	9
Bloating .....	3	5	4	2
Soreness .....	9	14	5	10
Nausea .....	11	16	7	9
Emesis .....	3	4	3	5
Cramps .....	5	14	5	15
Ultra .....	0	3	0	6
	46	69	37	56
	—	—	—	—

The following peaks are noted:

Heartburn—Calcium Gluconate-Aspirin.....	15 times
Bloating—Aspirin .....	5 times
Soreness—Aspirin .....	14 times
Nausea—Aspirin .....	16 times
Cramps—Aspirin .....	14 times
Calcium Phosphate-Aspirin.....	15 times
Emesis—Calcium Phosphate-Aspirin.....	5 times
Ultra—Calcium Phosphate-Aspirin.....	6 times

A perusal of Table 6 shows that during treatment with calcium gluconate-aspirin the milder group of gastrointestinal symptoms such as heartburn occurred more frequently than severe symptoms such as nausea and cramps, whereas with aspirin this condition was reversed. Calcium phosphate-aspirin acted much as did plain aspirin. In addition the total number of gastrointestinal complaints was greater with aspirin and calcium phosphate-aspirin than with calcium gluconate-aspirin. We therefore believe it fair to state that greater gastrointestinal distress, both qualitatively and quantitatively, occurred with the use of aspirin or calcium phosphate aspirin than with calcium gluconate-aspirin.

Tables 8, 9 and 10 show the gastrointestinal symptoms which developed in patients with gastrointestinal pathology during the four periods of treatment.

TABLE 7  
BILE TRACT DISEASE—6 PATIENTS

	Calcium Gluconate- Aspirin	Aspirin	Calcium Gluconate- Aspirin (2)	Calcium Phosphate- Aspirin
Heartburn .....	2	2	1	2
Bloating .....	1	0	0	0
Soreness .....	2	2	1	1
Nausea .....	1	2	1	3
Emesis .....	1	1	0	0
Cramps .....	0	3	1	4
Ultra .....	0	1	0	1
	8	11	4	11

The study of cases with bile tract disease (chronic chole-cystitis, cholelithiasis and post-operative cases) reveals the same relative findings noted in Table 6.

The findings in those with spastic colon as shown in Table 8 also confirmed the results obtained with the entire group of forty-six patients.

TABLE 8  
SPASTIC COLON—4 PATIENTS

	Calcium Gluconate- Aspirin	Aspirin	Calcium Gluconate- Aspirin	Calcium Phosphate- Aspirin
Heartburn .....	2	2	1	1
Bloating .....	0	0	0	0
Soreness .....	1	1	0	0
Nausea .....	2	2	1	0
Emesis .....	0	0	0	0
Cramps .....	2	2	1	3
Ultra .....	0	1	0	1
	7	8	3	5

PEPTIC ULCER—1 CASE

Calcium Gluconate-Aspirin (1).....	Soreness
Aspirin .....	Soreness and cramps
Calcium Gluconate-Aspirin (2).....	Heartburn
Calcium Phosphate-Aspirin.....	Cramps

TABLE 9  
SHORT ESOPHAGUS—2 PATIENTS

	Case 1	Case 2
Calcium Gluconate-Aspirin.....	Heartburn	Soreness
		Nausea
		Cramps
Aspirin .....	Heartburn	None
Calcium Gluconate-Aspirin (2)...	Soreness	None
	Emesis	
Calcium Phosphate-Aspirin .....	Soreness	None
	Emesis	

In this small group calcium gluconate-aspirin produced the most distress, calcium phosphate-aspirin the next and aspirin the least.

TABLE 10  
MISCELLANEOUS TABLE

	Calcium Gluconate- Aspirin	Aspirin	Calcium Gluconate- Aspirin (2)	Calcium Phosphate- Aspirin
Dizziness .....	10	11	18	18
Ultra Severe (Cease)				
Dizziness .....	2	0	3	1
Urticaria .....	5	11	9	11
Tinnitus Aurium.....	0	3	7	2
Precordial Pain .....	6	10	4	5

TABLE 11  
STUDY OF PATIENTS WITH HYPERTENSION

	1	2	3	4	5	6	7
Calcium Gluconate- Aspirin	0	0	0	Precordial pain	Precordial pain and dizziness	0	0
Aspirin	Precordial pain		Precordial pain	Precordial pain	Precordial pain	0	Dizziness
Calcium Gluconate- Aspirin (2)	Dizziness	0	Dizziness	Dizziness	Dizziness	0	Dizziness
Calcium Phosphate- Aspirin	0	0	Dizziness	Dizziness	Dizziness	Dizziness	Dizziness

*Dizziness.* One of the first symptoms of salicylization is dizziness. It is evident from Table 10 that quantitatively calcium gluconate-aspirin and calcium phosphate-aspirin produce more dizziness than ordinary aspirin. Several individuals had such severe dizziness with calcium gluconate-aspirin that they could not continue with the medication. They complained not only of dizziness but also of sweats and flushes of such a degree that everything "swam around them." If we accept these symptoms as evidence of salicylization, then the results indicate that calcium gluconate-aspirin produces more salicylization than does an equal amount of aspirin. Therefore, smaller doses of calcium gluconate-aspirin than of aspirin should afford relief from pain.

*Urticaria.* Urticaria is considered an allergic phenomenon. It developed less frequently as shown by Table 10 with calcium gluconate-aspirin than with aspirin and calcium phosphate-aspirin.

*Tinnitus Aurium.* This symptom developed in only a few instances. It is difficult to draw definite conclusions from it, unless it is interpreted as a further indication of salicylization.

*Precordial Pain.* During treatment with aspirin more than double the number of patients developed precordial pain than during the treatment with calcium gluconate-aspirin or calcium phosphate-aspirin.

Table 11 shows the results obtained in seven patients with hypertension.

This table shows definitely that aspirin produces precordial pain much more frequently in hypertensive individuals than does either calcium gluconate-aspirin or calcium phosphate-aspirin. With the latter two types of medication dizziness, a symptom of salicylization, appears more often.

*Conclusion.* Acetylsalicylic acid brings symptomatic and objective improvement in severe

cases of arthritis. Calcium gluconate acetylsalicylic acid or plain acetylsalicylic acid are more efficacious than calcium phosphate acetylsalicylic acid.

While calcium gluconate-aspirin and plain aspirin seem to be equally advantageous in the treatment of arthritis, calcium gluconate aspirin tends to produce fewer and milder symptoms in the gastrointestinal and circulatory systems. Furthermore, calcium gluconate-aspirin produces fewer and milder side symptoms in the equilibrium system than does plain aspirin or calcium phosphate-aspirin. Therefore, in prolonged medication for arthritis, calcium gluconate-aspirin is more advantageous than plain aspirin.

Calcium gluconate-aspirin produces more evidence of salicylization than does plain aspirin of the same dosage and about the same salicylization as does calcium phosphate-aspirin of the same dosage.

#### THE ETIOLOGIC, DIAGNOSTIC, AND MEDICOLEGAL PROBLEMS OF OCCUPATIONAL DIS- EASES

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The etiologic, diagnostic and medicolegal aspects of occupational diseases have in the past and will continue in the future to present difficult and serious problems to the practicing physician. There are good reasons for believing that the whole situation will become more complicated rather than more simple. Furthermore, the factors involved are deeply woven into the fabric of our whole social and economic structure.

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The real basis for the neglect of the technical and administrative aspects of occupational disease problems lies deeply rooted in our legislative experience. Compensation laws originally, at least in most states, made no provisions whatever regarding the occurrence of occupational diseases, but confined the regulations almost entirely to the problems of accidental injuries. As a result, traumatic surgery was greatly stimulated and there arose a considerable body of professional and lay persons who are thoroughly qualified on injuries, or became so because of the legal requirements.

Not so with occupational diseases, however, for the great majority of professional and lay groups in this country, at least so far, have been concerned only with those things which are required by law. Further proof of the vital importance of the situation can be adduced however when one knows that in the year 1935 there was introduced in more than forty states proposed legislation relative to the compensation of occupational disease disability.

Silicosis, about which we have heard a great deal more than we have actually seen in recent years, probably has made the general population occupational - disease - conscious, but there are other important occupational diseases deserving of serious consideration. Even with all the consequent grief attached, probably the silicosis situation may have a definite salutary effect, in stimulating action regarding the whole question of occupational diseases.

The purpose of this paper is merely to point out rather briefly some of the difficulties that have been encountered in the etiologic, diagnostic and medicolegal problems of occupational diseases and to suggest also rather briefly measures which will tend to relieve these difficulties.

*Etiology.* Etiology has been a most neglected factor as evidenced by the repeated review of medical records of hospitals, dispensaries and private physicians. The chief error committed in this respect has been to assume that because the patient gives a history of exposure to dust, for instance, that he must be given a provisional diagnosis of silicosis, regardless of the kind and amount of dust to which he has been exposed, and too often the word "provisional" is omitted. Perhaps most often this error has been committed because of reliance upon unproved statements made by the patient and recorded in the

history. This state of affairs is equally true of other occupational diseases.

The fact remains, as the U. S. Public Health Service has definitely shown in its excellent industrial hygiene studies in different industries, that mere exposure to potentially harmful substances does not constitute a hazard. Industrial conditions must be critically studied and measured before correct diagnosis can be made. We might take a lesson from our epidemiological friends so well written in the pages of the history of the control of communicable diseases; in establishing the etiology of occupational diseases, we might well apply the same carefully controlled and scientific procedures which have resulted in such definite etiological information being established in relation to the problems of communicable diseases.

One of the fallacies into which we have easily fallen (and which has also been repeatedly committed by inspectors, engineers and employers) has been reliance on visual inspection of industrial conditions. These methods have and will continue to be efficacious in the control of accidental injury hazards, but no one has yet been able to prove that you can by looking at a cloud of dust tell how much free silica or quartz it contains, or how much lead, carbon monoxide gas, sulphur dioxide, trichlorethylene vapor, or benzol vapor there is in the air merely by visual inspection. In other words, the common causative factors of occupational diseases are what may be called "hidden hazards." It is only by resorting to scientific methods of measurement that an adequate and proper estimate of the type of exposure may be obtained and one may then tell whether there is a real occupational disease hazard present in the industrial environment or not. This conclusion can be arrived at by the comparison of the findings in any given industrial environment with established criteria which have been previously set up through the research work of various organizations, notably the U. S. Public Health Service and the U. S. Bureau of Mines, as well as many other groups and individual investigators.

It is not expected that the physician become an engineer, but it is respectfully recommended that he take interest enough and inform himself sufficiently so that he will learn to establish etiology in occupational disease problems upon just as scientific a basis as has been previously

used in regard to similar situations in communicable diseases where bacteriology plays so prominent a part, and also in surgical diseases or injuries in which the mechanism of the provocative agent has been thoroughly studied and demonstrated.

Another phase of the etiological aspects demands our attention for a moment: it has always been acknowledged by the laity that diagnosis and treatment are the essential prerogatives of the physician. One does not, however, find especially in relationship to occupational disease problems and other similar problems, a like conception on the part of the laymen in regard to the etiology. It is true that in many instances, the knowledge of the physician must be supplemented by that of the engineer. We should be careful however that too great encroachment is not made upon the rights of the individual practitioner in this regard. It might be interesting to note in passing that some twelve or thirteen states are now considering the establishment of bureaus of industrial hygiene, mostly in the departments of health of the states, for the purpose of working out some of these etiological problems in regard to occupational disease. The establishment of these bureaus has been made possible by the provisions of the National Social Security Act in allocating funds in most instances upon a dollar for dollar basis for use in this projected work. It is hoped that these bureaus and their relationships will be very definitely guided and directed by medical influence and advice. It is my belief that these etiological problems are just as much within the province of the physician in regard to occupational diseases as are such matters in regard to non-industrial diseases. It is difficult to understand how proper diagnosis and treatment may follow unless etiological information is based upon methods of precision and also properly interpreted and applied to the diagnostic findings and the treatment principles.

*Diagnosis.* The diagnosis of occupational diseases presents a problem not less difficult than that concerned in the etiology, in fact in some respects the difficulties are greater. The first consideration here as has been indicated is a clear picture of the etiological relationships so that there may be established cause and effect phenomena as demonstrated by the causative fac-

tors in the industrial environment, and as manifested by the effects on the human body as shown by clinical data. Diagnosis involves not only searching and adequate examinations with appropriate history which should be detailed, but also pertinent clinical laboratory and x-ray information, as well as differential opinion. And it is in this differential opinion that great care must be exercised, for the differential diagnosis of occupational diseases from nonindustrial maladies will always be a difficult clinical problem. The source of the difficulty here lies in the fact that the symptomatology and frequently the physical findings in occupational diseases imitate so closely the symptomatology and physical findings of nonindustrial diseases. One must, therefore, make use of specific procedures which are designed especially as diagnostic guideposts. To give a number of examples: Dr. George Gehrmann in a recent paper on "Papilloma and Carcinoma of the Urinary Bladder in Dye Workers," called attention to the fact that these pathological lesions differed in microscopic structure in no way from similar tumors of the bladder of unknown etiology; it is therefore important to determine what the exposure has been in these instances and to know the nature and the concentration of the substances which may produce these tumors, establishing the facts by scientific investigation and intelligent interpretation. It is also a well-known fact in the consideration of lead cases, that the symptomatology and the physical findings often imitate other diseases and furthermore that an appreciable amount of lead may be ingested in the daily diet from the eating of common foods; this calls for a measurement of the amount of lead in the air to which the employee was exposed and furthermore the intelligent use of the McCord test for basophilic aggregations in the blood, since positive findings have been proved to indicate lead absorption before real intoxication occurs. Quite recently Schrenk and Yant of the Bureau of Mines of Pittsburgh have devised a urinary test for inorganic sulphates specifically adapted to tests on workers exposed to benzol vapor. This procedure is really a measure of the exposure rather than a help in diagnosis, but no doubt will be extremely valuable.

Because the great majority of occupational diseases which are most disabling and therefore



of most economic importance are caused by the inhalation of various kinds of injurious substances, a great deal of emphasis will no doubt be given to the examination of the effects of the inhalation of such substances upon pulmonary tissue, upon the blood and upon the excretions. A great many procedures are now at our disposal for the purpose of examination of the body and its fluids, but undoubtedly great impetus will be given to this part of our diagnostic armamentarium.

Pre-employment and periodic examinations are really diagnostic problems, for it is the purpose of these examinations in industry to establish by medical opinion and judgment the status of the human body and to say whether the individual is capable of going into industry and pursuing his occupation or can continue with some occupation where it is known that a real hazard exists. One cannot help but believe, after reviewing records from various portions of the country and in different industries, that the pre-employment and periodic physical examination procedure must undergo considerable adjustment and improvement if good results are to be obtained in the specific adaptation of these procedures to industrial problems. This principle has been very successfully followed by the railroads and there is no reason why similar improvement cannot be made in reference to occupational disease problems.

One wonders also whether the examining physician could not be of greater service and give more efficient advice regarding acceptability for employment or continuance in it, if he was conversant with the following three things: 1. the nature and extent of the industrial exposure into which the employee will go or has been; 2. the effect of this specific exposure upon the normal and abnormal physical states of employees, as interpreted by the physical status of the individual on examination; and 3. the nature of the protective devices supplied by the employer and as to whether these devices are functioning efficiently. It is realized that these procedures are somewhat out of the present program of physical examination, but it is also expected that the physician will be more and more called upon to know and appreciate such information, so that he may function better as a diagnostic medium.

*Medicolegal Problems.* The chief medicolegal issues in occupational disease problems arise because of deficiency in etiological information, and consequent errors in diagnosis. Reduced to simple terms, the industrial commission or the arbitrating body in considering any individual case, essentially wants to know whether the claimant became disabled because of the contraction of an occupational disease, what the nature and extent of his disability is, whether he actually has the occupational disease alleged, and whether he contracted that occupational disease because of peculiar circumstances definitely associated with his occupation and its industrial environmental influences. Let me say here that the wise employer has no intention of evading compensation for actual and typical occupational disease disability, but should not be compelled to pay for nonindustrial disease disability which has no definite relationship to employment. Similarly, the employee has every right to expect that he can labor in the process of making his living without undue industrial hazard; but he may not and should not expect to draw compensation for disability due to diseases of non-industrial pursuits.

A great deal of divergence of opinion has arisen over legal and informal definitions of occupational diseases. Because it will be of interest to you and to many other physicians in this state as to what the legal requirements in Illinois are going to be on this subject, I shall take the liberty of quoting to you from Section 6 of the Workmen's Occupational Diseases Act as passed unanimously by the 59th General Assembly at the Third Special Session this year, and effective October 1, 1936:

"Section 6. In this Act the term 'occupational disease' means a disease arising out of and in the course of the employment. Ordinary diseases of life to which the general public is exposed outside of the employment will not be compensable, except where the said diseases follow as an incident of an occupational disease as defined in this section.

"A disease shall be deemed to arise out of the employment, only if there is apparent to the rational mind upon consideration of all the circumstances, a direct causal connection between the conditions under which the work is performed and the occupational disease, and which can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment and which can be fairly traced to the employment as the proximate cause, and which does not come from a hazard to which the

workmen would have been equally exposed outside of the employment. The disease must be incidental to the character of the business and not independent of the relation of employer and employee. The disease need not to have been foreseen or expected but after its contraction it must appear to have had its origin in a risk connected with the employment and to have flowed from that source as a rational consequence."

It is believed that when studied even superficially, the language of this section, from which the physician may determine the legal point of view as to what constitutes an occupational disease in this state, also demonstrates why emphasis has been placed on the etiological relationships of occupational diseases and the importance of medical diagnosis and differential opinion.

It is not possible to go into the minute details of occupational disease problems in this paper, but it is thought that enough has been given to indicate what the major problems now are and may be in the future, for the physician who is called upon to render service in this field. Perhaps it is not too much to say that the medical profession must extend its influence and basic knowledge in occupational disease work if usefulness is to be continued and preserved.

*Summary.* In summary, we may conclude that:

1. It will be to the best interests of the medical profession as a whole that the physician who does occupational disease work take a great deal more interest in acquiring definite information regarding the nature and severity of industrial exposure as an etiologic factor in the production of occupational disease.

2. Diagnosis, as difficult as it may be in some instances, can be made more definite by the application of specific procedures designed as diagnostic guideposts. Differential opinion will more and more play a decisive role in diagnosis and will be of considerable value medicolegally.

3. Especial attention should be given to the evaluation of exposures in industry occurring through inhalation, because of the presence or evolution of dusts, fumes, gases, or vapors. The measurement of the effects of such inhalation upon the human body and the interpretation of these effects will become increasingly important not only as scientific medical groundwork in occupational diseases, but also in application to medicolegal problems.

4. Pre-employment and periodic examination technique must undergo some change and im-

provement before it will be possible for the physician to give the service which he is really capable of giving and should give in relationship to industrial experience.

5. Passage of compensation laws compensating for disability due to occupational diseases will require more definite information concerning the kinds and amounts of industrial exposure and will emphasize the necessity for the establishment of cause and effect relationships pertaining to industrial exposure and the manifestation of such exposure in the human body.

6. Greater opportunity for the study of industrial environment and clinical material must be afforded not only to medical students, so that we may be bringing on "new blood," but also for the continued enlightenment of existing practitioners and further for the use of postgraduate demonstrations and teaching.

7. The medical profession must certainly look to its laurels, if it expects to preserve its integrity in the various phases of occupational disease investigation.

8. Finally, the standards of industrial medicine should be very definitely raised by the establishment of qualifications for the men who are to be the leaders in this field of medical endeavor and further, by the recognition of industrial medicine as a definite specialty by official medical groups identified closely with organized medicine.

## DISCUSSION

Dr. Wm. D. McNally, Chicago: It is deplorable that we haven't more people present to hear this admirable paper which Dr. Sappington has just given us. This is a problem for the general practitioner. This room should have been filled to its capacity because in October the general practitioner will be very busy. Between now and October he should be acquiring an education along this line, and during the past half hour he has had an opportunity to lay a foundation for that education. The general practitioner sees the workman in industry first, the man doesn't come to see Dr. Sappington or myself, but somebody else. The general practitioner has a duty to protect the health of that patient; he also has a duty to protect the industry. Without industry our communities cannot continue to grow. We can see the effects of the shutdown of industry during the present depression. Some of the diseases that Dr. Sappington mentioned are depression diseases.

Silicosis was known for hundreds of years. Lead poisoning was known for hundreds of years. One of the first cases of silicosis which came to trial was in Chicago against the Western Electric, where I was



a witness, over twenty years ago. For a period of fifteen years we did not hear of silicosis. It was only about 1929 or 1930 that it began to develop as a menace to industry. Industry needed to be punished. We had been endeavoring for years to have them clean house, the foundries and other places, and even today we have that problem of trying to educate them in protecting the workmen against dust, against poisonous fumes, etc.

Now, under the heading of etiology, Dr. Sappington should have stressed the occupational history. His paper was one which covered a large amount of ground and he couldn't possibly include all these points. If he had more time I know he would have stressed this matter of occupational history. The general practitioner, when he sees a patient, may take his occupational history and take it with one word. He may record that this man was working in the automobile industry. That has no meaning inasmuch as there are many phases of the work without hazards and others with hazards. For example, take the metallic parts of the tops of cars that are welded together with a solder containing lead. The men engaged in this work use blow torches with which they melt the excess solder; during this process the fine particles of lead are thrown directly into the faces of men working opposite them four or five feet away. The same happens during the use of emery wheels or carborundum wheels, where a fine dust is thrown over towards the workmen on the other side, who may or may not be provided with a mask. An analysis demonstrated that lead dust in one industry extended for fifteen feet away from where a man was using the emery wheel. This industry provided the men with pig snout respirators but they refused to wear them. When the men become warm and perspiration appears on their faces, they develop a slight eczema or dermatitis while wearing these pig snout respirators and for that reason refuse to wear them. When going into the history of an individual it is important to find out what type of work he was engaged in, in that particular job. In a case before the Industrial Board this last winter a man had worked for the National Lead Company. His lawyer thought immediately that he was a handler of lead. It so happened that the man had worked in the boiler room. An examination of the air in the boiler room showed there was no lead whatsoever. The amount of carbon monoxide present was so small that he could not claim injury due to either of these causes. The lawyer on the other side then changed his plea to that of pneumoconiosis, stating that the man handled ashes, and that coal dust was responsible for his condition. Fortunately, we had made an examination of the air and a quantitative determination of the dust, showing the amount of dust present per cubic foot in actual count and also a quantitative examination showing the amount in milligrams. So, we won the case simply by having more data than the other lawyer, both on lead, carbon monoxide and the dust count.

It is very necessary that an education along this line start with the general practitioner. He comes in contact with all these people and it is his duty to inform

them of the hazards, if there are any, and also to instruct them as to how to protect themselves. If he is a physician for the industry, he should not hesitate to tell the general management of the hazards. They will listen to him today where they wouldn't a few years ago.

Now, under diagnosis, it is imperative that every possible test is made on some of these cases. A man may have been working in a dusty atmosphere, or even working in lead, but his history may show that long before he worked in lead he had a hyperacidity or symptoms of hyperacidity, or he may have had symptoms of an ulcer. From the history and x-ray pictures, you will find occasionally that you have a case in which a gastric or duodenal ulcer was present antedating the employment of this particular individual.

Take the blood count. A blood smear in chronic lead poisoning doesn't mean very much. An examination of thirty-two men three weeks ago who had been exposed to lead failed to show basophilic stippling in the smear by the McCord method, yet these same individuals had a content of 0.07 to 0.39 milligrams of lead per liter of urine. All this lead was being excreted. So, in chronic cases don't depend upon the direct blood smear to show absorption. Have a chemical examination made of the urine to show the amount of lead elimination. The clinical examination is very important also. The patient may show lead excretion without any of the cardinal symptoms of lead intoxication. A card index should be made of every individual coming into a factory.

The doctor spoke of the preoccupational examination. Some industries don't want it because they fear that those who are already employed may think there is something wrong with them that perhaps they have silicosis or lead poisoning and may bring suit. These men, however, if employed regularly never bring suit. I can safely say that 90% of the cases in which I have testified were cases of men who had been discharged for some specific reason as inefficiency, drunkenness, etc., and then brought suit against the industry on some particular phase, such as silicosis, lead, benzol or some other factor.

A blood examination in chronic lead poisoning will always show a low hemoglobin and a low red count. The red count would be below 4,500,000. That should indicate to the industrial physician or to the general practitioner that something is wrong. Then you may investigate further by having an examination of the urine made. An examination of the blood is very important in benzol poisoning. Men who are working with rubber cement, rubber shoes or other rubber products inhale benzol. The quickest way to detect benzol poisoning is by the red count and the white count. This last summer I had one case who had a red count of 1,100,000 and a white count of 900. That individual died in spite of repeated blood transfusions and liver therapy. The urine will show an increase of sulphates in benzene poisoning.

Now, as to the medico-legal phase, you shall always find lawyers and shall always find doctors who are willing to take various sides of a case of alleged

poisoning by lead, arsenic, carbon monoxide or even silicosis. If we can educate the general practitioner as to what is a real hazard, and to make a diagnosis and keep records, we shall have fewer of these cases coming before the Industrial Board.

Many industries don't want postoccupational examinations. They fear that, if we make an examination of that individual and find something wrong, although the individual may not know it, others will quit work and bring suit against them. The easiest way to combat that is to say it is the requirement of the statute that the individual be examined and that the air or other hazards in the particular industry be investigated.

Dr. C. O. Sappington, Chicago: I want to thank Dr. McNally for his discussion and just briefly comment on some of the things that he mentioned. In the first place, he talked about the medicolegal phase. It may be very enlightening to know that in a considerable number of silicosis suits in which I have been privileged to serve as a medicolegal witness in different states throughout the country, I have never found a single actual case of silicosis in suit. That may be due to several reasons, but you can draw your own conclusions.

In regard to the etiology, it is true that the history should be stressed a great deal, as Dr. McNally said. Often I have run across the word "laborer" as the occupation, not only given on the death certificate but also given in the occupational history. Of course, you know that "laborer" means nothing from the standpoint of classifying the man as to what work he does.

Respirators were mentioned by Dr. McNally. They are very valuable adjuncts in the control of the inhalation of dust and noxious vapors, if we use the word respirator to mean any kind of protective respiratory equipment, but I want to impress upon you that the use of respirators or respiratory protective equipment of any sort is not a substitute for dust control, which is the real issue. Dust should be controlled at its source and no final reliance should be put upon any protective equipment, because there are many problems that arise in getting men to wear the various types of respirators. This does not mean that there are not specific instances where protective equipment is the real answer.

I should say to you briefly that it is necessary to know, before you go in to a plant, what you are going to look for. I recall an interesting experience in which I was associated with the chief chemical engineer of a very important company in an industrial group in Chicago. We went out to see a plant where several reverberatory furnaces were used and, in discharging the slag at the end of the furnace, the slag was wet with water. As we stood looking at it, this chief chemical engineer of this important company said to me, "Doctor, I am very much concerned regarding the carbon monoxide and the methane in the air." I replied to him, "I would be very much concerned about the carbon monoxide but I would have no concern whatever about the methane because methane is physiologically inert." It is true that in certain quantities or in certain concentrations it is explosive but

it has no effect upon the human body unless it exists in such tremendous proportion that it will produce oxygen deficiency.

At another time I was inspecting a plant in which lead was used in pots. It was poured out in pigs, to be used later, for various kinds of type. I was told by the employer that the insurance company would not accept insurance from this organization until it was definitely known whether there was lead in the air. The insurance inspector said he could see lead in the air. So we made measurements of the concentration of lead in the air and found no dangerous exposure.

Again, there was an incident in which the chief engineer for an insurance company reported to his company that the risk should not be accepted because of the fact that the men were dipping metal parts in aluminum and standing these metal parts up against the wall to dry after dipping them. The engineer said to the company, "You should not accept this risk because that's a health hazard and will cause an occupational disease." As a matter of fact, you probably all know that aluminum fumes are not toxic. There are many times that these sorts of decisions pervade the whole problem of occupational diseases.

In regard to the diagnosis of lead poisoning, and particularly with regard to the use of blood smears, I think they are quite valuable under certain circumstances, but they should be considered, as I stated in my paper, through an intelligent use of the McCord test for basophilic stippling. If we measure the amount of lead excretion in the urine or feces, or both, that one examination means nothing. But, as I stated in my paper, the common articles of diet have an appreciable amount of lead in them, and, if you ingest that lead, you can't tell which is industrial and which is not. Therefore, there is no way of fixing the responsibility, which seems to be one chief problem we have on our hands today.

I, therefore, believe firmly, in the light of the work of Kehoe and others, that histories in these cases are necessary if you are going to make a scientific check-up of the amount of lead excretion in the urine or feces, or both.

Regarding benzol exposure, as I stated to you, Schrenk and Yant, of the Bureau of Mines of Pittsburgh, have devised a urinary test for inorganic sulphates. That's useful in finding out whether there has been an exposure to benzol vapor or not, before the blood shows any change in the white and red cells or the platelets. I didn't say that in my paper and I apologize to Dr. McNally for not saying it because, otherwise he wouldn't have brought up this question. However this test is a measure of the exposure before any pathologic effects have been noted on the men exposed and I believe therefore is of tremendous value.

The problem of examinations in industry will always be with us. I am inclined to believe that more and more men will be examined whether they like it or not. That's neither my making nor your making. I believe physical examinations will continue to be instruments of great help in deciding what kind of material industry is accepting from which to check the effects of ex-



posure in industry as to what that material is doing and how it is reacting. I believe there will be continued improvement in the technique of pre-employment examinations.

## ACCIDENTS AND ERRORS ENCOUNTERED IN THE INCISION FOR EXTRACTION OF SENILE CATARACT

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It was my original intention to discuss the accidents and errors which might arise during the course of a cataract extraction, but after giving the subject some little thought and much reflection, I soon concluded that the time allotted would barely permit me to cover, even superficially, the first step in the operation proper, namely the incision. It is, therefore, of the accidents and errors which one encounters during this first step in the extraction of senile cataract of which I intend to speak.

An uncomplicated incision is not such a commonplace occurrence after all. If there is anything more gratifying than the feeling which a surgeon experiences at the termination of a classic incision, it is the feeling of satisfaction that he may realize following a well-managed complicated incision which he is fortunate enough to bring to a successful termination.

Untoward accidents, as we all know, may occur at each and every stage of the operation and in some rare instances, one may feel, at the conclusion of the operation, that at least one complication has hampered him during every step of the procedure.

One of the most annoying complications is to encounter a friable conjunctiva. This is particularly disconcerting if the conjunctiva does not tear until after the puncture has been made. If the conjunctiva proves to be friable, there is no good in attempting conjunctival fixation at another place. The best procedure to follow has been, in my experience, to immediately transfer the point of fixation to the superior rectus muscle. This shift can be easily and quickly accomplished and especially so if a bridle suture is in position. Personally, I prefer conjunc-

tival fixation. Scleral fixation has its advantages but I am sure that many surgeons using this method of fixing the globe find the lens much easier to dislocate with forceps, suction or pressure, for the simple reason that they have dislocated the lens in their attempt at firm scleral fixation. Because of this fact, scleral fixation might well be considered an advantageous method. There are surgeons who, not only use a bridle suture on the superior rectus, but also on the external rectus, thereby securing reasonably good fixation without forceps in case the conjunctiva should tear.

I am certain of one thing, however, that in the first attempt at fixation, if the conjunctiva should tear, the proper procedure is to resort to scleral fixation immediately, providing the puncture has not been made. Should the conjunctiva, however, be so deceitful as to not display its friability until the tip of the blade is in the anterior chamber, I am equally confident that immediate transfer of fixation to the superior rectus is the wise course to follow. In rare instances when conjunctival fixation has failed me, I have been fortunate enough to have a patient, by his own volition, and aided by a bridle suture in the superior rectus, look strongly downward and permit successful termination of the incision.

The so-called intralamellar incision is a possibility of course, but hardly a complication to be expected even in semi-experienced hands. We all know that a very shallow anterior chamber would be conducive to this type of error. Every surgeon should be permitted once in his career to introduce the knife with the cutting edge downward. Should this mistake be made, there are two methods of procedure open to the operator. The wisest measure would be to withdraw the blade and postpone the operation to another date. However, it is surprisingly easy to flip the knife blade quickly through 180 degrees and proceed with the incision.

Any operator who has done much cataract surgery must surely be familiar with the numerous perils connected with the making of the incision and I am sure that few will deny that it is the most important part of the operation and upon this procedure depends mainly the favorable outcome of the operation. A surgeon may excuse himself later in the dressing room for having

made a faulty puncture. However, one may enter the tip of the knife too far forward into the cornea or too far backward into the sclera and in either instance it becomes very difficult to bring the incision to a successful close. The proper site of the puncture is  $1\frac{1}{2}$  to 2 m.m. above the horizontal meridian at 9:47 o'clock, if you wish to put it that way, and 1 m.m. posterior to the sclerocorneal junction.

As the puncture is made, there should not be the slightest hesitancy in passing the knife blade through the anterior chamber. If at this point, either fixation fails or the iris becomes engaged in the tip of the blade, hesitation in instances, is not only permissible, but in my opinion is occasionally indicated. However, one should be careful not to withdraw the knife blade in the least during this period of hesitation as the loss of aqueous will immediately follow, and one might, because of this accident, perpetrate an even greater injury. In the instance of complete withdrawal of the knife the operation should be postponed to a later date. Injury to the iris is usually painful even under the best possible anesthesia, and moreover, it should be carefully avoided for the reason that it is often responsible for more serious complications. The hemorrhage which attends this accident is particularly annoying and the pain is more than likely to produce an unruly patient.

Should one be so unfortunate as to engage the iris with the tip of the knife, it is best to lift the tip of the blade quickly by depressing the scalpel handle and carry on the incision to an immediate conclusion. If only a few fibers are engaged, they are cut through easily and one may be surprised to find that the iris has not been visibly damaged. The unfortunate end result of a serious engagement of the iris is an iridectomy much wider than the surgeon might desire.

The knife in all instances must be carried through the anterior chamber parallel to the iris. If fixation remains good and the iris has been hurdled successfully, it is then time to make the counter puncture. I suppose one might say that under good working conditions, a faulty counter puncture is rare, but I will venture to state that the best of surgeons are guilty of this error on occasions. Counter puncture made too far forward into the cornea makes for a shortened

incision and delayed healing. One made too far posteriorly into the sclera makes a difficult stiff incision with much hemorrhage. Counter puncture a slight degree anteriorly is not a serious error but one made much too far backwards, is fraught with doleful possibilities.

Incisions well within the cornea are slower in healing and in subsequent dressings are liable to break open—an accident quite conducive to iris prolapse. My rule has been to effect the counter puncture at the time when the tip of the blade barely becomes obscured from view.

After the counter puncture, comes, in my opinion, the really difficult part of the incision. Some surgeons use a sawing motion in long or short sweeps in the horizontal plane. This method has its advantages but its advocates will admit that the iris is quite likely to be injured by the cutting edge of the knife blade. A second and better method is to depress the handle at the moment the counter puncture is made, and to thrust the blade almost to the hilt, thereby sweeping the tip upwards using the point of puncture as a fulcrum and finish the incision on the next withdrawal motion if possible. In any event, it is wise to advance the cutting blade of the scalpel as rapidly as possible above the lower border of the pupil. There is less danger of losing aqueous and engaging the iris in using the incision just described. Long sweeping strokes are preferable to short choppy ones. Rotation of the cutting edge of the knife forward immediately when the cornea has been entirely freed at the limbus will avoid too large a conjunctive flap at the apex. Great care should be exercised not to get this flap too large. There is slight danger of making too large a conjunctival flap excepting at the apex of the incision. A large flap is conducive to prolapse of the iris. The ideal incision should be about  $1\frac{1}{2}$  m.m. conjunctival flap throughout the length of the wound from puncture to counter puncture with perhaps a 3 or 4 m.m. flap at the apex.

Presentation of vitreous may occur immediately at the conclusion of the incision. This accident is most likely to occur when the incision has been too deep and sclera is included in the incision at the apex of the wound.

While the actual delivery of the lens is a tense breath-taking moment and seems to the surgeon to be the critical moment—I would suggest that



the proper moment for breath-holding on the part of the surgeon should be during the time when he is making his section for the real foundation of a successful cataract extraction lies in the success of the incision.

Good firm lifting fixation without pressure, a clean uncomplicated incision of proper size with narrow conjunctiva flap which will permit the introduction of four or five sutures if deemed advisable, practically insures the surgeon that the extraction will be brought to a successful close.

It is needless to say that clear illumination is necessary in making a correct incision.

Watching a considerable number of ophthalmic surgeons impressed me with the fact that practically all of their surgical work is accomplished by manipulations of the fingers and wrist and I have been further impressed with the fact that practically all of these men operate without giving their forearm any support. A few years ago in watching a celebrated portrait painter at his work, I observed that he always did his painting by manipulation of his fingers and wrist but that in his finer touchings with the brush he used his fingers with some slight wrist motion and during this procedure he always gave his forearm full support.

This observation gave me a thought which I have put into practical use in my ophthalmic surgery. In the first place, I operate in the sitting position in a chair of usual height. The operating table which I designed and had made for me by V. Mueller & Company, is of sufficient height to bring the patient's eyes on a slightly higher level than my knees. The patient's eyes are 26 inches from the floor. This permits me to rest my forearms on the anterior surface of my thighs. This position does not hamper me in any of my movements and at all times I have a steady support which permits me to govern my finger and wrist movements much more accurately and steadily. I have found that in this position, there is no strain as there was in standing with the arms akimbo—a position which is awkward and not conducive to delicate work.

I feel reasonably confident that by this method, I may be able to at least postpone the tremor which seems to be dreaded and feared by ophthalmic surgeons.

## CHRONIC PROSTATITIS — A CRITICAL REVIEW OF 1000 CASES

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*Introduction:* This paper is based on a study of 1,000 unselected cases of chronic prostatitis, the records of which were taken from the private patients of one of us. (H.L.K.). It is a well recognized fact that the private patient suffering from chronic prostatitis affords a better opportunity for study than does the ordinary dispensary patient who is notoriously irregular in attendance, lacking in co-operation and usually discontinues treatment before he is discharged as cured.

Although chronic infections of the prostate are common, yet it is astonishing how infrequently this condition is searched for in the routine examination of patients, and still more significant is the frequency with which the prostate is overlooked in the routine search for a focus of infection. This oversight may be due to the fact that chronic infection in the prostate frequently does not produce local symptoms. As an example of the latter statement, let us cite the many cases of arthritis, iritis and neuritis, in which attention is not directed to the prostate until late in the course of the disease.

*Etiology:* In the earlier literature on the etiology of chronic prostatitis, many predisposing factors were mentioned that were supposed to have a direct bearing on the cause of this disease. Of these predisposing factors, sexual abuses, such as over-indulgence, withdrawal, masturbation and prolonged sexual excitement, were frequently observed. Furthermore, excessive use of alcoholic beverages was also given as an important place in the list of causes. It is difficult to prove or disprove whether or not any of these factors have any direct bearing on the etiology of chronic prostatitis. However, in this series of cases the above mentioned conditions played a relatively minor role.

Of the lesions in the prostate which predispose to and frequently are followed by chronic prostatitis, the most common is acute prostatitis which may be caused by either the gonococcus or other microorganisms. In recent years, espe-

cially since more careful bacteriological studies have been carried out, a surprising number of cases of non-specific prostatitis have been found. It is possible that some of these were formerly diagnosed as gonorrheal prostatitis.

The frequency of acute prostatitis as a complication of gonorrheal urethritis has been estimated by various authors as from 50 to 80%. Therefore, failure to recognize this complication and to institute proper treatment may justify the statement that untreated acute prostatitis, as a complication of urethritis, may be a factor in producing chronic prostatitis, or chronic prostatitis may be the direct result of a neglected or incompletely treated urethritis. Many authors are of the opinion that most cases of chronic prostatitis have this origin.

While it is a well known fact that infections of the prostate during the course of a gonorrheal urethritis occur in a large percentage of cases, it does not necessarily follow that all cases of chronic prostatitis are of gonorrheal origin. Thus, Young, in his series,<sup>1</sup> found a history of gonorrheal urethritis in 73.3%, no etiological factor in 14.8%, and von Lackum found that 74% of his series had a history of specific urethritis.

In our series of cases only 58.9% gave a history of one or more attacks of gonorrhea, whereas in 33% the patient stated that he did not previously have an attack of gonorrhea.

The following table contains an analysis of the cases who had a history of one or more attacks of gonorrhea, and likewise the number of patients who had no history of a previous attack of gonorrhea.

Cases with previous gonorrhea:		
With one attack.....	425	
Two attacks .....	97	
Three or more attacks.....	67	
	<hr/>	
	589	= 58.9%
Cases with no previous gonorrhea.....	330	= 33.0%
Cases without information in history..	81	= 8.1%
	<hr/>	
Total .....	1,000	Cases

We believe that acute epididymitis as a complication of gonorrheal urethritis is synonymous with an infection of the adnexa. Therefore, if a patient gives a history of having an attack of epididymitis during an attack of gonorrheal urethritis, it behooves us to examine the prostate and seminal vesicles for the presence of pus cells. The following table gives the number of patients in this series who had such attacks:

Left epididymitis .....	89 patients = 8.9%
Right epididymitis .....	70 patients = 7.0%
Bilateral epididymitis .....	30 patients = 3.0%
	<hr/>
Total .....	189 patients = 18.9%

Unfortunately, many patients, as well as physicians, are of the opinion that chronic prostatitis is a venereal disease and, therefore, if one suffers from chronic prostatitis the deduction is made that it is, in all probability, of gonorrheal origin. Such observations and conclusions are not borne out in our study. Furthermore, this general viewpoint is an injustice to many patients, and the promiscuous use of the term "chronic gonorrheal prostatitis" is not only unfair to the patient, but is careless medical speech. Our use of the term "chronic gonorrheal prostatitis" is limited to those cases in which a careful examination of the prostate showed gonococci.

In this series of one thousand cases, gonococci were found in the prostatic strippings of only 24 cases. The fact that only 24 cases of chronic prostatitis showed gonococci in the prostatic fluid emphasizes the statement made above that chronic gonorrheal prostatitis is a relatively rare finding.

One phase of this subject that has received very little consideration is the relationship between abscesses of the prostate and chronic prostatitis. For the purpose of discussion, attention may be called to the fact that, in some cases, the abscess is the complication of an acute gonorrheal urethritis. However, not all cases of abscesses of the prostate have this origin; for instance, one of us (H.L.K.)<sup>2</sup> has shown that abscess of the prostate may be due to the passage of sounds, catheters, and cystoscopes, or that it may be metastatic in origin and follow such lesions as furuncle, carbuncle, osteomyelitis, empyema, or an appendiceal abscess.

Many of the patients are relieved of their symptoms, either when the abscess ruptures spontaneously (into the urethra, rectum or bladder), or when the abscess has been opened and drained (perineal prostatotomy). The point which we wish to emphasize at this time is that in all, or nearly all, of these cases, there is an associated prostatitis.

After the abscess has been drained, or after it has ruptured, the symptoms subside. If these patients are examined carefully, it will be discovered that the prostatic fluid still contains pus, which can be demonstrated by simple examination of the prostatic strippings; hence there re-



mains a possible latent focus of infection, and the treatment should therefore be directed towards clearing up the infection. Because of our experiences just mentioned, we never discharge a patient who has been operated upon for abscess of the prostate until the strippings are free of pus cells.

When stones are present in the prostate, careful examination will usually show an associated chronic prostatitis. In cases in which there are no symptoms referable to the prostate, stones may be found in routine roentgen-ray examination. Massage, in such cases, generally shows the presence of pus cells in the expressed fluid. The relationship between stones and infection is still a matter for discussion. Some are of the opinion that the stones produce a chronic infection, whereas, others believe that stones are the result of chronic prostatitis.

The relation of urethral stricture to chronic prostatitis is usually not appreciated. Many times attention is directed toward the treatment of the stricture with little thought given to the examination or treatment of the prostate. We believe that chronic prostatitis is a concomitant finding in the large majority of patients with strictures of the urethra, especially filiform or impassable strictures, or strictures of small calibre. This association has been a relatively frequent one in our experience, and it has not been uncommon to see many patients, who have had efficient treatment for strictures, elsewhere, present themselves for various symptoms due to chronic prostatitis. These patients previously had no treatment directed to the prostate. Therefore, the statement is justified that every patient with urethral stricture should have a careful examination of the prostatic fluid.

The presence of an infection in the prostate is sometimes not recognized until after the passage of urethral instruments such as sounds, catheters, or cystoscopes. This infection, although present and dormant before instrumentation, is stirred into activity by the instrumentation and is characterized by chills and fever and often severe urinary symptoms. We believe that the clinical entity called "urinary chills and fever", that frequently follows urethral instrumentation, is a manifestation of infection in the prostate gland. On the other hand, instrumentation may be the direct cause of an infection in the prostate. This fact may or may not be recog-

nized at the time, and, if not, the condition remains untreated for years.

Since the monumental work of Billings<sup>3</sup> on focal infections, the role of the prostate in the production of metastatic lesions in other parts of the body has been generally appreciated. On the other hand, the fact has not been generally recognized that the prostate may be the metastatic manifestation of disease in a remote part of the body. For example, we have seen many cases in whom infections of the prostate gland followed acute tonsillitis, sinusitis, and otitis media as well as acute respiratory infections, influenza and occasionally furunculosis.

We agree with Pelouze<sup>4</sup> that in many instances prostatic infection cannot be cleared up without treating other distant foci of infection as mentioned above. In the following table are given some of the lesions that were commonly met with in this series of cases:

Chronic tonsillitis .....	92 patients
Infected teeth .....	75 patients
Disturbance of colon.....	43 patients
Chronic sinusitis .....	25 patients
<hr/>	
Total .....	235 = 23.5%

**Bacteriology:** Although the literature on chronic prostatitis is very extensive, it is interesting to note that the bacteriology has not received very much consideration and study. Some of the earliest writers to study, by cultural methods, the bacteriology of the prostatic fluid are Young, Geraghty and Stevens.<sup>1</sup> More recently, von Lackum<sup>5</sup> has devoted much study to this question and reported his cultural results in a large series of cases. Our records show that cultures were made in 407 cases. No special culture media were used; therefore, our results were, or are, at variance with the results obtained by workers who have made a special and intensive study of this problem by using special culture media. We feel that had special cultural methods been used by us in this series, the results would show somewhat different types of organisms. This statement is verified by our recent investigations in which special media have been employed. In a recent study a much larger number of streptococci have been found than in the present series. Our studies are presented in the following table.

B-coli .....	231 cases
Staphylococci .....	142 cases
Diphtheroid .....	12 cases
Pyocyaneus .....	12 cases
Streptococci .....	10 cases

Besides cultural methods, microscopic examination of the expressed fluid was carried out. In our technique, stained smears were made as a routine procedure. Not only are stained slides made at the time of the first examination, but this procedure is carried out from time to time during the entire course of treatment. The repeated use of this method of examination showed changes in the bacterial flora. In other words, during a long course of treatment the bacteriology changed so that organisms found at the first examination were replaced by other organisms during the course of the disease. In a few instances, smears were positive when cultures were negative and vice versa.

In view of the fact that this method can be used so easily as a part of the office routine, we believe that stained smears should be made in every case from time to time during the course of treatment. In some instances, this method of examination has been of great value. For example, during an acute exacerbation of symptoms with an increase in the amount of pus, there is not only a return of the organisms previously absent in the smears, but they are present in much larger numbers.

We have also noticed that besides a return or increase in the number of bacteria present in the stained smear, there has been a change in the bacterial flora.

Disappearance of bacteria from the smears or a diminution in number are points of information that can be obtained easily, and, of course, may be guides that influence the prognosis and the length of time the treatment should be continued. Contrary to the notion that generally prevails, this is not a difficult thing to do and no special technique is required.

In the following table are given the results of examinations of stained prostatic strippings in 633 cases:

#### EXAMINATION OF STAINED FLUID

B-coli .....	361 cases
Staphylococci .....	193 cases
Gonococci .....	24 cases
Streptococci .....	12 cases
Bacilli .....	43 cases
<hr/>	
Total .....	633 cases

*Cytology:* The normal prostatic fluid has a translucent, gray-white appearance, and about the viscosity of glycerine. It is homogeneous. Under the microscope, normal prostatic fluid

consists of lipid granules, epithelial cells, corpora amylacea, and spermin crystals.

In the patient who suffers from chronic prostatitis, there are marked changes in the cytology of the unstained prostatic fluid. The normal elements disappear and are replaced by pus cells and degenerated epithelial cells, as well as cells filled with large refractile dropets. As the prostatic condition improves, the pus cells gradually diminish and the normal cellular elements return.

The microscopic examination of the strippings from an infected prostate shows two interesting findings. In some instances, many clumps of pus cells are seen, whereas in others there is a uniform distribution of pus cells. It is our opinion that the examination of the fresh unstained prostatic fluid is one of the most valuable diagnostic aids in the treatment of chronic prostatitis.

For the purpose of indicating the amount of pus present in the microscopic field, we use 1+, 2+, 3+, 4+ for grading, which, while not scientifically accurate, clinically serves as an important method in tabulating the progress of the patient. Usually as the treatment is continued the amount of pus gradually diminishes, and is accordingly recorded as 3+, then 2+ and later on 1+, until the strippings are free of pus and the normal elements have reappeared.

We have seen patients in whom the strippings showed 1+ pus at the time treatment was discontinued, but following an acute attack of tonsillitis or sinusitis, the prostate again showed a 4+ pus without any localizing symptoms. On the other hand, we have seen patients in whom the strippings showed 4+ pus at the time treatment was discontinued, and who upon subsequent examination a year later showed normal prostatic fluid.

In view of the fact that an examination of the unstained prostatic fluid can be made in a few minutes, we believe that it is a very valuable adjunct in treating this group of patients. Naturally, the amount of pus found will depend upon the severity of the infection, and the duration of the disease, and whether or not the patient has had previous treatment.

In the following table is given the amount of pus according to this method of grading at the time the patient first presented himself at the office for examination and treatment:



EXAMINATION OF PROSTATIC FLUID

4+ .....	480 patients
3+ .....	244 patients
2+ or less.....	276 patients
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1,000 patients	

*Serology—Complement fixation test:* We do not wish at this time to review the literature on the value and the limitations of the gonorrheal complement fixation test, but only to state the results of our experience with this test in this series of cases, since we feel that the number is large enough to justify certain conclusions.

In some cases of arthritis associated with chronic prostatitis the question may occasionally arise regarding the etiology of the arthritis, that is, whether or not the patient has an attack of so-called "gonorrheal rheumatism." The use of the complement fixation test may be of value in answering this question. The results of 496 examinations are at hand. In some of the patients in whom the test was positive there was no history of an antecedent gonorrheal infection and the examination was negative for gonococci, so that great care must be exercised in interpreting the results of this test.

In only 20 of which the test was positive and negative in 476, so that a positive test was obtained in about 4 per cent.

COMPLEMENT FIXATION TEST

Positive .....	20 patients
Negative .....	476 patients
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Total .....	496 patients

*Urinary Findings:* It is a well recognized fact that many patients with chronic prostatitis present themselves for examination and consultation because of pus in the urine, which, in many cases, has been found by the family physician, the life insurance examiner, or by a clinical laboratory. In our series, the most frequent finding in the examination of the urine was pus cells. Besides pus cells, red blood cells or albumin may be found, and in a small percentage (7%) casts were present. It is also well to recognize that the patient may have a urine that is clear and sparkling and yet the microscopic examination shows the presence of pus cells. The following table gives the results of the urine analyses in our series:

URINE

Pus .....	797 patients
Blood .....	184 patients
Albumin .....	152 patients
Casts .....	77 patients

*Rectal Examination:* The diagnosis of chronic prostatitis is made from the rectal findings and an examination of the prostatic fluid. We believe that changes in the consistency of the prostate are of the utmost importance, and in a careful examination can readily be differentiated from the consistency of the normal gland. One of the most important findings is that of increased consistency, which, at times, may be so hard that it arouses suspicion of malignancy. Or the opposite may be present, viz: the prostate is soft and boggy. In rare instances the periphery may be hard with a soft center, due no doubt to an old abscess. Any change in the consistency should arouse suspicion for the presence of infection. Another important observation relates to the group in whom the rectal findings recorded a normal prostate, but the prostatic fluid revealed pus in varying amounts from 4+ to 1+.

In 207 of these 1000 cases, the rectal findings were recorded as showing a normal prostate. However, the examination of the prostatic stripplings showed the presence of pus cells. Therefore, it is important to bear in mind that the rectal examination alone is not sufficient to establish the diagnosis of chronic prostatitis in a given case.

We also wish to call attention to the fact that there is a borderline group of cases in which the rectal findings and prostatic fluid are normal on first examination, and upon repeated examinations pus cells are found in the stripplings. The rectal findings are reported in the following table:

RECTAL FINDINGS

Normal .....	207 patients
Hard and irregular.....	465 patients
Increased size .....	440 patients
Periprostatitis .....	289 patients
Boggy .....	180 patients

*Pathology:* The gross anatomical changes are characterized chiefly by an increase in the consistency of the prostate. The surface may be smooth, but in other instances it may show more or less irregular elevations which are firm and hard. The capsule is generally adherent and can only be removed with great difficulty.

On section, the tissue is gray-white with varying amounts of fibrous connective tissue which may make up three-fourths of the gland. In surfaces made by cutting, a turbid fluid escapes and such surfaces are irregular. Here and there, one may see small cystic areas that vary in size

up to a split pea and are filled with either a gray, yellow cheesy material, or a dark watery fluid.

The micropathology may be discussed under two headings. First, diffuse inflammatory changes in the gland; and second, multiple localized regions of polymorphonuclear or round cell infiltration. In a microscopic study of many sections of prostatic tissue obtained from autopsy material, we were not able to observe an instance in which the infection was limited entirely to either the glandular structure or interstitial tissue. (Figures 1 and 2). In other words, we feel that a differentiation between parenchymatous and interstitial prostatitis is exceptionally difficult to make. A majority of the microscopic sections showed the acini to be filled with a poorly stained material made up chiefly of desquamated cells enmeshed in a homogeneous mass that stained a pale pink. Regions of inflammatory reaction appeared around the base of the glandular structure which in many cases extended into the acini. These regions are characterized by an increase of the polymorphonuclear cells, lymphocytes, and plasma cells and show a marked variation in the proportion of one to the other. In other sections, there was a marked increase in the interstitial tissue characterized by a proliferation of fibrous tissue and infiltration of lymphocytes and polymorphonuclear cells. In the second type, the chief micro-

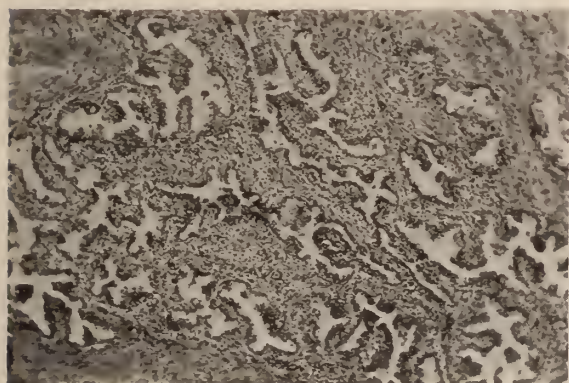


Fig. 1. Showing extensive round cell infiltration with connective tissue proliferation.

pathological changes appeared to be localized and circumscribed areas of round cells or polymorphonuclear cells which would fill the view of a high power field. (Fig. 3). These circumscribed regions were distributed throughout the section, and, in some instances located near the

base of the acini. The center of these regions, many times, was found to be broken down and filled with partly destroyed cells. At other times, a few small abscesses were observed.

*Associated Pathology:* In this series 395 patients were examined with the cystoscope and of

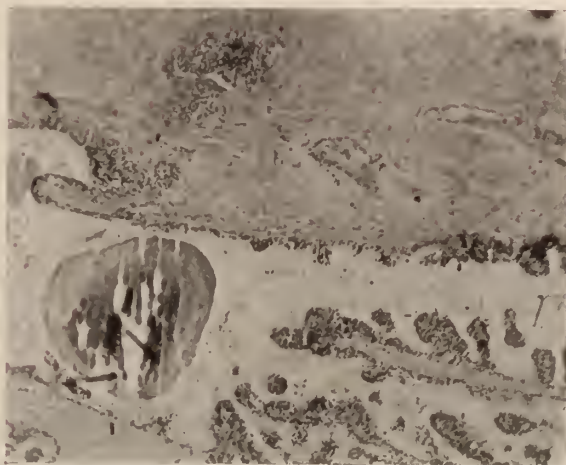


Fig. 2. Showing some of the acini filled with granular detritus and round cell increase in the interstitial tissue and many large starch bodies.

this number 61% showed changes around the bladder neck and prostatic urethra, and 39% were normal.

The important observations as seen through the cystoscope are as follows: The bladder neck is usually irregular and the mucous membrane fluffy and granular. Frequently small translucent cysts, similar to cystitis-cystica, can be seen. Many times a trigonitis is present. At times, quite the opposite picture is observed, in that the bladder neck is shiny, white and pale. In such cases it is frequently difficult to differentiate between a true fibrosis of the bladder neck and the secondary change from an infected prostate.

The most important changes in the urethra from chronic inflammation of the prostate gland are in the region of the verumontanum. These pathologic changes are chiefly characterized by edema, redness, and in some instances localized hemorrhagic areas. Flakes of pus may be seen with the urethroscope. In another group, the verumontanum may be small and atrophic, the tissue gray and pale from fibrosis. Frequently such a picture follows the promiscuous use of topical applications of various medicine, such as silver nitrate, etc. We have never felt justified in treating such inflammatory lesions in the



posterior urethra by topical applications of any kind.

In our opinion infections of the seminal vesicles occur in practically all cases of chronic prostatitis. Many urologists share this point of view. The seminal vesicles may be soft and atrophic, or enlarged, thickened and hard.

The occurrence of epididymitis has been discussed previously in this paper.

It is surprising to note the frequency with which changes in the lower ureter occur in cases of chronic prostatitis as demonstrated by means of intravenous urography. These gross pathologic alterations are characterized by dilatation and atony which, in some cases, may involve the whole ureter, but more frequently the lower part. As a result peristalsis is interfered with and ascending kidney infections may occur. This

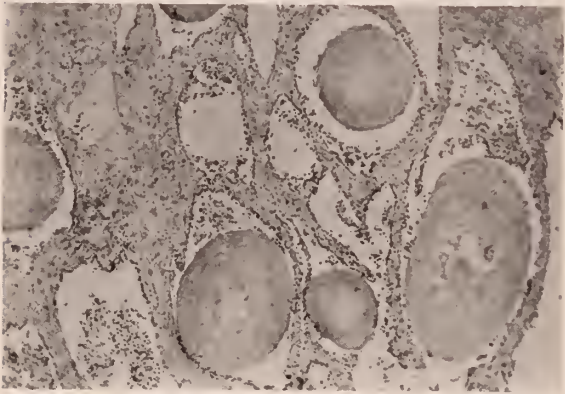


Fig. 3. Showing localized areas of round cell infiltration.

condition has frequently been mistaken for strictures of the ureter with the result that the patient is subjected to many ureteral dilatations. We have repeatedly seen such instances. Usually the dilatation and atony of the ureter subside after the prostato-vesiculitis is cleared up.

Dilatation of the pelvis with clubbing of the calyces and mild urinary stasis has been demonstrated, in this series, often unexpectedly by means of excretory urography in patients with chronic prostatitis. Our experiences are in accord with those of von Lichtenberg.

SYMPTOMS

The one striking impression from this study is that symptoms of chronic prostatitis are not at all characteristic; many times the symptomatology is so diversified that an infected prostate is not suspected. On the other hand, in a certain

number of cases, a carefully obtained history will at once direct attention toward an investigation of the prostate. Because the symptoms in this series were so varied, we have classified them under the following headings.

*Urinary symptoms:* The relationship of the prostate gland to the neck of the bladder is such that one would expect an infection in the prostate to produce urinary symptoms. If this fact is borne in mind, fewer would be the diagnoses of cystitis. Patients who have relapsing attacks of cystitis often suffer from prostatitis, and the treatment should, therefore, be directed not to the bladder but to the prostate.

Again we wish to emphasize the fact that the presence of an urethral discharge does not mean gonorrhea, and in order to make the proper diagnosis it is necessary to examine the discharge microscopically. The gross appearance and character of the discharge is variable. It may be profuse, or so scant that urethral stripping is necessary to obtain it, or it may be present only in the morning, the so-called "morning drop." The discharge may be thin, sticky and watery, very similar to glycerin, or thick and creamy and present only during the day. The symptoms are given in the following table:

Urethral discharge .....	389 patients
Frequency .....	346 patients
Burning .....	307 patients
Nocturia .....	289 patients
Urgency .....	149 patients
Hesitation .....	148 patients
Stinging .....	121 patients
Pyuria .....	105 patients
Dribbling .....	102 patients
Hematuria .....	86 patients
Straining .....	80 patients
Prickling .....	65 patients

*Sexual symptoms:* It is very important to bear in mind that chronic prostatitis plays a very important role in the production of sexual symptoms, a fact that is not often recognized. It should also be noted that much marital difficulty, so-called "incompatibility," is due to chronic prostatitis, and many of these cases ultimately end in the divorce courts. Therefore, we, as physicians, can often prevent such a situation from occurring by the recognition of the underlying cause. The importance of obtaining an accurate history in these cases is self-evident. Many times it is difficult to differentiate between impotence from chronic prostatitis, and so-called psychic impotence.

The one outstanding symptom in this series

was the presence of premature ejaculations found in practically 20% of the cases (19.7%) and it is probably the one symptom that causes the patient the greatest concern.

The various sexual symptoms follow in the table:

Premature ejaculations .....	197 patients
Loss of desire .....	157 patients
Weak erections .....	139 patients
Loss of erection.....	77 patients
Nocturnal erections .....	54 patients
Painful ejaculations .....	42 patients
Hemospermia .....	36 patients
Painful sexual intercourse.....	25 patients
Sterility .....	18 patients
Prostatorrhea .....	15 patients

*Metastatic symptoms:* This group of symptoms is interesting for the reason that frequently the prostate is not suspected nor investigated as a source of infection. In our series the most common metastatic lesions were arthritis, neuritis, and iritis. The following table reveals the number of patients who had such symptoms.

Arthritis .....	286 patients
Neuritis .....	150 patients
Iritis .....	24 patients

It is our impression that one of the most common causes of lumbar-ache in middle aged men is chronic prostatitis. Frequently patients present themselves with metastatic symptoms that have extended over many years and in whom a careful search has been previously made for foci of infection with the exception of the prostate gland. The teeth and tonsils have been removed; sinuses drained without any improvement in the symptoms. The prostate gland is then examined and if infected and the infection cleared up is followed by the disappearance of the painful joints, sciatica, or neuritis.

One of the spectacular types of patients in this group are those with acute iritis in whom an infected prostate was found as the cause of the condition.

Although we do not believe that in every case there is a connection between the metastatic symptoms and an infected prostate, or between infected prostate and other foci, yet we have always strongly advocated the removal of any suspicious foci in those patients who have metastatic symptoms.

*Nervous symptoms:* It has not been so many years since the diagnosis of sexual neurasthenia was a very common one, but in more recent years this term has practically disappeared from the literature,

The analysis of the patient presenting a long list of nervous symptoms, combined with sexual disturbances deserves a great deal of thought and care, in order to fathom out cause and effect. There are times in which the patient's symptoms are caused from fear. Fear that an old attack of gonorrhea may return, or that it has not been entirely cured and that he may transmit the infection to his wife or partner. This condition has led to a psychic impotence in some cases and in others a great psychic depression.

From this series, we have observed patients, who because of their disturbed sexual symptoms caused from a chronic prostatitis which had gone unrecognized, had developed a severe melancholy or depression which in one case led to suicide.

*The silent prostate:* Although we realize that the use of the term "silent prostate" may be open to criticism, still we feel that its use is justified to designate a certain group of cases for want of a better, or more descriptive term. By this term, we mean a group of patients with general symptoms, the causes of which are not apparent, and in whom upon further study the symptoms have been found to be caused by chronic prostatitis, and yet, as far as the prostate is concerned, there are no local symptoms. This group is extremely interesting from the standpoint of differential diagnosis because a majority go on for many years without being recognized.

#### TREATMENT

The literature concerning the treatment of chronic prostatitis is interesting from the standpoint of the many methods advocated for the treatment of this disease. It is our opinion that the two most important elements in the treatment of chronic prostatitis are the application of heat to the prostate and the systematic use of prostatic massage.

In every case in this series of 1,000 cases some form of heat—either in the form of hot sitz baths twice a day, or the use of hot rectal irrigations, or the use of hot water through a prostatic psychrophore, or the use of heat applied through the rectum to the prostate by the means of the Bransford Lewis electric heater, was recommended. Each and every patient was advised to use heat, and the importance of heat was explained to the patient so as to encourage its daily use. Equally as important as the use of heat per rectum is the employment of prostatic



massage. In order to be effective this should be carried out at stated intervals. As a rule, massage is carried out twice a week and, as the patient's condition improves, the number of treatments are reduced so that the patient receives massage once a week; and a little further on massage is carried out about once every ten days. In other words, as the patient's condition improves the number of treatments is reduced. We have never been impressed by the necessity nor the advantage of daily prostatic massage. In some of the patients a period of rest was recommended; that is, after treatment had been carried out for three or four months, the patients were instructed to omit the prostatic massage. In some of the patients upon their return in two or three months we were agreeably surprised to find that the prostatic strippings were free from pus.

It is not necessary to call attention to the fact that the objectives to be attained by massage are to empty the prostate of its purulent contents, to stimulate absorption, and to increase the blood supply to the prostate. Naturally, massage must be without pain. It is needless to state that the massage should be firm enough to express the infected secretion. It should never be followed by or associated with discharge of blood at the external urethral orifice, nor should it produce pain.

Cases with turbid urines are treated either by irrigations with potassium permanganate or silver nitrate, or instillations of protargol or argyrol into the bladder and urethra. However, when the patient's urine is clear we do not irrigate and we do not give him deep urethral injections. Massage is followed by anterior urethral injections, the patient lying flat on his back on the table. The fluid is held in the urethra with a penis clamp. In a certain number of instances the fluid will trickle back into the deep urethra. Since we have discontinued routine irrigations as well as deep instillations, the incidence of epididymitis as a complication during the course of treatment of chronic prostatitis has practically disappeared.

It is needless to say that patients with stricture of the urethra need appropriate treatment.

It is a well known fact that chronic prostatitis is slow to respond to treatment and that it is necessary, therefore, to have the patients under treatment for long periods of time. It is because

of this fact that many patients are not cured—they discontinue the treatment and also at times the physician loses interest in the patient. We feel that the best results are obtained in the cases in which the patient cooperates by carefully adhering to directions and in which the physician enthusiastically carries out the local treatment.

Highly seasoned foods, condiments and alcoholic beverages should be avoided. We doubt very much whether the occasional use of alcohol in small amounts, or the occasional use of condiments during the course of chronic prostatitis is harmful to the patients.

Constipation and gastrointestinal upsets have a direct bearing on infection of the prostate. Therefore, the gastrointestinal tract deserves careful management.

A very important contribution to the treatment of chronic prostatitis has been the advocacy of the removal of foci of infection. We agree with this thought. Teeth, tonsils and sinuses, if suspicious for foci of infection, should be treated or removed.

Vaccines, serums, injections of foreign proteins and intravenous injections have never given us very much aid. Recently Grant has again revived interest in intra-prostatic injections.

In none of these 1,000 cases was surgical intervention directed toward the prostate employed. We feel that prostatectomy in cases of chronic prostatitis is not indicated and likewise prostaticotomy is rarely justified except in that rare type of case discussed by Dr. David M. Davis.<sup>6</sup>

The patients in our series had only one type of treatment as far as the prostate is concerned, viz: massage and heat which is applied either in the form of an electrical or hot water prostatic heater. In the following table are given the duration of treatment and the results in this series:

One month .....	85 cases
Two months .....	172 cases
Three months .....	171 cases
Six months .....	234 cases
One year .....	148 cases
Two years .....	90 cases
Three years .....	56 cases
Four years .....	30 cases
Five years or over.....	14 cases

#### RESULTS

Cured .....	412 cases
Improved .....	398 cases
No change .....	180 cases
Not stated .....	10 cases

## SUMMARY AND CONCLUSIONS

1. In 33% of the patients in this series there was no history of a previous gonorrheal infection.

2. In only 4% was a positive complement fixation test obtained.

3. Foci of infection, such as tonsils, teeth, sinuses, gastrointestinal tract and upper respiratory tract, may be causative factors in the production of chronic prostatitis.

4. Infections of the prostate can be the cause of arthritis, neuritis, myositis, iritis, psychasthenia and other nervous manifestations.

5. The value of using a standard for determining the amount of pus present in the stripings and its value in showing the progress made by treatment is given.

6. The importance and value of repeated microscopic examinations of the prostatic fluid is emphasized.

7. Attention is called to the frequency with which the rectal examination with the examining finger is negative.

8. Attention is directed to the fact that chronic prostatitis may run a silent course and also to the fact that its manifestations are variable.

9. Contrary to the general opinion that exists in the minds of patients and physicians, this is not an incurable disease.

10. Our experience based on this series of cases emphasizes the fact that the treatment must be carried out over a long period of time and, furthermore, that the most efficacious agents are heat, massage and the removal of suspicious foci of infection.

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## INFECTIOUS MONONUCLEOSIS

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Infectious mononucleosis is a disease characterized by fever, enlarged and swollen cervical lymph glands, peculiar posture of the head, abdominal pain and an increase in the number of mononuclear cells of the blood. It was first described in 1886 by Filatow of Moscow, and later by Pfeiffer in 1889, when for a long period it was called by that name. It usually occurs in the Spring and Winter months, attacks both sexes, and is much more prevalent in individuals between the ages of 5 and 15, and comparatively rare in children below the age of 5. The etiology is still questionable, though a filtrable virus is supposedly the cause. The disease is contagious, infection occurring usually through the respiratory tract.

The incubation period is usually between 5 and 10 days, and the onset is usually sudden. The symptoms then simulate very closely that of an influenza, tonsillitis or pharyngitis. The patient complains of headache, malaise, cough, sore throat, aching of the bones and fever. At times there may be obstipation, vomiting and even diarrhea. The fever may reach 105, and associated with a very rapid pulse and slight prostration. Usually, enlargement of the cervical lymph glands occurs early, and within 48 hours the patient complains of swelling and tenderness of these glands. They are usually posterior to the sternocleidomastoid muscle and occur in chains. Due to the tenderness of these glands the patient usually holds his head as that of a rheumatic torticollis. One can easily see that, due to the position of the head with voluntary rigidity of the neck, one could easily confuse the disease with meningitis. Usually the cervical lymph glands begin first on the left side, and in a few days become bilateral. These glands in a few days may involve the bronchial, retroesophageal, mesenteric, axillary and inguinal regions. The temperature range is usually quite high, as—

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sociated with morning remissions, for 3 to 21 days. As the temperature recedes, the glands eventually disappear. The spleen and liver may be palpable. In a few cases jaundice and maculopapular skin rash were present.

In 40% of cases, the mesenteric lymph glands are involved with their characteristic abdominal pain, nausea, vomiting, temperature, leucocytosis and local findings of rigidity. In these cases a diagnosis of an acute abdominal lesion is usually made, such as an acute appendicitis, with immediate surgical intervention. When the bronchial glands are involved, the patient usually presents the symptoms of a croupy cough—at times to be misdiagnosed as post-pertussis, tuberculous tracheobronchial pathology, etc. In retroesophageal glandular involvement, dysphagia is usually quite pronounced.

The blood shows an absolute and relative increase in the non-granular mononuclear cells. The white blood count varies between 15,000 and 30,000. Of the total number of cells, 80% to 90% are of the non-granular type, and, according to Longcope, are in the following forms: 1. Small mononuclear leucocyte, identical with the small lymphocytes; 2. Large mononuclear cells identical with the large mononuclears, and 3. Atypical mononuclear cells.

When the entire picture is elicited with its characteristic symptoms, plus high temperature, diffuse glands, palpable spleen, leucocytosis, with a so-called lymphocytic response of 90%, it is no wonder that it is easily confused with acute leucemia, and many a clinician is surprised to find that his so-called case of acute leucemia gets well. One knows very well that the prognosis of infectious mononucleosis is good, and that for an occasional complication of nephritis, otitis media, or suppuration of the gland, no deaths have been reported.

Thus, one can easily see that the disease is of interest to the otolaryngologist, dermatologist, surgeon and internist; for the differential diagnosis includes such conditions as tonsillitis, pharyngitis, influenza, rheumatic torticollis, meningitis, tuberculosis of the lymph glands, lues, hodgkins, acute abdominal conditions such as acute appendicitis, skin rashes, mediastinal tumors, cases of jaundice and lastly, and most important, acute lymphatic leucemia. It is the early usage of the heterophilic agglutination test

that absolutely and specifically clinches the diagnosis of infectious mononucleosis.

It is interesting to note the developmental steps in the specific usage of the heterophilic agglutination test in infectious mononucleosis. Forssman observed that emulsions of the tissues, other than blood cells, of the guinea pig, cat and horse stimulate the production of lysins for sheep red blood cells, just as sheep red blood cells themselves do when injected into rabbits, and that these substances contain the heterophil antigen. The heterophil antigens or antibodies are distinct from specific bacterial agglutinins and precipitins; this is demonstrated by the absorption tests. The above is the Forssman phenomena. Davidsohn<sup>1</sup> showed in 1929 that, following the injection of horse serum, which is a known carrier of heterophil antigen, an increased titer of heterophil antibodies occurred in the blood of patients suffering from horse serum disease.

Paul and Bunnell<sup>2</sup> in 1932 found that the sera from cases of infectious mononucleosis agglutinate sheep cells in a titer of 1-64 or higher, while the sera from normal patients or those suffering with other pathological conditions agglutinate sheep cells to a lower titer of 1 to 8. They also found that patients who received horse serum had a high titer of 1-64 or higher. They observed the presence of the heterophil agglutinins in four cases of infectious mononucleosis. As a control they recorded 2,000 tests, which were done on patients who entered the hospital. Among these cases were those of blood dyscrasias, such as purpuras, pernicious anemia, leucemia, aplastic anemia, polycythemia, heart, gastrointestinal, and infectious diseases. In none of these cases was the titer higher than 1-8 and in most cases there was no response at all. A positive test shows a titer of 1-64 or higher.

Bernstein<sup>3</sup> reported 5 cases of infectious mononucleosis in 1934, in which 4 showed a definite positive heterophilic agglutination test. One test was positive a few days before the blood showed its characteristics of the disease. This case showed the presence of the antibodies, before the appearance of the monocytes in the blood. The

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titer here was 1-256, which remained high for 10 days. It took 3½ months before a normal level was reached. The 5th case that he reported of a child of 6 gave a negative result in the presence of a definite infectious mononucleosis.

Bunnell<sup>4</sup> in 1933 reported 15 cases of infectious mononucleosis, in which the heterophilic agglutination test was positive in 13 cases. The titer was 1-64 or higher.

Rosenthal and Wenkebach<sup>5</sup> recounted the histories of 10 patients in whom the only detail whereby their illnesses could be differentiated from infectious mononucleosis was the normal concentration of heterophile agglutinins in their blood sera. They felt that those cases that had a positive test were classified as infectious mononucleosis and those that were negative were classified as glandular fever. They also report that a positive Wassermann occasionally occurs in infectious mononucleosis. Turk in 1907 reported a case which he confused with acute leucemia.

The heterophilic agglutination may remain positive from 6 weeks to 9 months, and even longer, before normal values are reached. The incubation period for a positive test is usually about 6 days; the same is true for a positive reaction in serum sickness. The lowest titer in infectious mononucleosis which may be considered as positive is 1-64, while the highest titer may reach 1-4096. Usually the height of the agglutinin response is fairly well correlated with the severity of the disease; while the development of the heterophil agglutinins for sheep cells run parallel to the formation of the pathological lymphocytes. As one gets a decrease in the agglutinin titer, there is a corresponding decrease in the number of monocytes. It is interesting to note that an absolute lymphocytosis of normal lymphocytes may persist for months. Those cases, which are not due to infectious mononucleosis or serum sickness, may give a positive agglutination of a titer of 1-8; this, however, has no significance whatsoever. In many cases the agglutinins were maximal in the first serum tested, while the peak of the patho-

logical lymphocytes did not occur for several days.

According to the viewpoints of Van Ravenswasy<sup>6</sup> as to the significance of the heterophilic reaction; there are two explanations for the presence of sheep cell agglutinins in the sera of patients with infectious mononucleosis. The first being that the etiological agent of the disease, bacterial or virus, serves as a heterogenic antigen in their production. He cites, as an example of the above, the fact that Shiga dysentery bacilli contain the Forssman's antigen; and also that the heterophilic antibodies produced by organisms of the genus *pasteurella* agglutinate avian erythrocytes. The other explanation, expounded by Meyer, is that the agglutinins are normally present, but are markedly increased in infectious mononucleosis. He also compares this response to a similar reaction where he noted an increased serological response in the sera of pregnant women with *Y* dysentery bacilli in a high titer.

On the other hand Bailey and Raffel<sup>7</sup> have studied the sheep cell agglutination in infectious mononucleosis and have come to the conclusion that it is a specific test in that disease. They, however, believe that a heterophil or Forssman antibody phenomena is not responsible for the reaction, and that the antibodies are not found in normal serum, but are rather a specific response occurring only in infectious mononucleosis.

Davidsohn<sup>8</sup> states that by means of the absorption test, one can easily differentiate serum sickness from infectious mononucleosis.

#### REPORT OF CASES

Case 1. G. L., female, nurse, aged 23 years, was admitted to the medical service of Dr. M. Lewison at the Mt. Sinai Hospital, on November 19, 1934, complaining for the past week of pain along the angle of the left jaw, which was followed in a few days by a chain of enlarged glands along the posterior border of the left sternocleidomastoid muscle. This was followed in a day or two by enlargement of the glands on the right side of the neck. For the last 4 days she complained of generalized abdominal pain, persistent in character, much more pronounced in the right lower quadrant. She also stated that she felt "Grippy." With

4. Bunnell, W. W.: A Diagnostic Test for Infectious Mononucleosis, *Am. J. M. Sc.*, 186: 346, 1933.

5. Rosenthal and Wenkebach: Die Bedeutung der Heterophilen Antikörperreaktion für die Diagnose der Infektösen Mononukleose. *Klin. Wchnschr.*, 12: 499, 1933.

6. Van Ravenswasy, A. C.: The Heterophile Agglutination Test in the Diagnosis of Infectious Mononucleosis. *N. E. J. of M.*, 211: 1001-1004, 1934.

7. Bailey, G. H., and Raffel, S.: Hemolytic Antibodies for Sheep and Ox Erythrocytes in Infectious Mononucleosis: *J. Clin. Investigation*, 14: 228-244, 1935.

8. Davidsohn, I.: Personal interview—Mt. Sinai Hospital, Chicago.



the above history of abdominal pain, she was admitted to the service as a suspect case of acute appendicitis.

On admission her temperature was 100.6 R, pulse 105, and respiration 22. Her essential findings were a bilateral chain of small, tender palpable glands along the posterior borders of both sternocleidomastoid muscles together with axillary and inguinal adenopathy. The spleen was definitely palpable. Some slight tenderness throughout the abdomen was present. At that time a diagnosis of infectious mononucleosis was made by the author before the blood count or heterophilic agglutination was done. She ran a 99.6 temperature for 5 days. On the same day of admission her W.B.C. was 14,150; Hb 86; R.B.C. 3,970,000; urine and Wassermann negative. The differential test showed the following:

Date	W. B. C.	Band forms	Segmented Neutrophils	S. L.	Abnormal L.	Monocytes
11-19-34 (date of admission)	14,150	2.5	24.	57.5	11	5
11-20-34	10,100	3.5	29.	45.5	16.5	5.5
11-26-34	11,900	..	52.	29	7	12

The heterophilic agglutination test taken (11-20-34) the next day after admission, showed a positive titer of 1-640. This was repeated 8 days later (11-28-34) after the patient had made an uneventful recovery, with a titer again of 1-640. The test remained positive for a few months.

Case 2. M. S., male, aged 19 years, entered the medical service of Dr. Richard Gordon on Sept. 28, 1933, complaining of diffuse abdominal pain for 5 days. The patient stated that for the last 5 days he felt sick; followed by generalized abdominal pain, especially in both lower quadrants. He had a feeling of fullness and distention after eating, associated with a good deal of belching. At no time did he vomit. He also noticed some pain in the right axilla, to be followed in two days by a glandular swelling.

He was admitted to the hospital with a temperature of 101. His essential findings were a red pharynx; few palpable glands (small) along the borders of both sternocleidomastoid muscles; a walnut size, tender

mann, negative. Fragility test—beginning .46 and complete .32. The differential showed:

Date	Neutrophils	S. L.	L. L.	Mono-cytes	Un-differentiated cells
9-29-33	14	56	6	6	18
9-30-33	21	55	6	3	10

The tentative diagnosis was acute lymphatic leucemia, colitis or appendicitis. He was sent to the operating room (9-29-33) for a biopsy of the gland, with a diagnosis of acute lymphatic leucemia. The right axillary gland was removed—and showed a hyperplasia of the reticular endothelium. On the 30th of the month the heterophilic agglutination test came back showing a titer of 1-2560. The patient made an uneventful recovery.

Case 3. E. H., female, single, aged 18 years, entered the medical service of Dr. I. A. Rabens on July 20, 1934, complaining of epigastric pain for 5 days, headaches 10 days and vomiting for 2 days. On July 10, 1934, she developed a severe headache; complained of dizziness; on the 13th she had some vague pain in her right leg which subsided the next day, to be followed by cramp-like diffuse abdominal pain which localized in the epigastrium. Her temperature then jumped from 100 to 103. The onset was sudden, associated with severe headaches, malaise, high temperature, abdominal distress and vomiting. Her pulse was rapid, temperature persisted for over 2 weeks, varying between 101-103. Her essential findings were enlarged tender cervical glands on the left side, which came on one week after the onset and which gradually lessened in size. The spleen was definitely palpable. B P 95/60; urine showed a 3+ albumin. A tentative diagnosis of tuberculous adenitis, mesenteric cyst with hemorrhage, diverticulitis of the colon or a pedunculated cyst of the ovary was made. The patient was worked up from a viewpoint as to the causes of prolonged temperature. Thus the following work was done which revealed no positive information. Von Pirquet—negative; Montoux 1-10000 negative; x-ray chest—negative; agglutination tests for typhoid, paratyphoid A and B negative; also for Shiga, Flexner, Hiss and Brucella abortus—negative. These tests were repeated twice. Stool—negative. Coagulation time 2½ minutes; bleeding time 5 minutes. Blood culture after 10 days—negative. The blood showed the following: Hb 82; W. B. C. 12,600; R. B. C. 3,700,000; blood platelets 170,000. The differential showed as follows:

Date	Hb.	R. B. C.	W. B. C.	Segmented Neutrophils	Lymphoblasts	S. L.	L.L.	Monocytes	Remarks
7-26-34	82	3,700,000	12,600	7	8	80	1.5	3	Granulocytes 14 Non-Granulocytes 86
7-28-34	84	3,800,000	12,400	10	6	78	2	2	Eosinophils 2
7-30-34	82	3,550,000	15,400	11	6	72.5	3	5	Eosinophils 2.5
8- 3-34	..	.....	15,400	8	1	79	8	2.5	Eosinophils 1
8- 6-34	..	.....	11,600	20	1	74	2	3	

gland in the right axilla; a few small glands in the left axilla; palpable bilateral inguinal glands. The liver was one finger breadth below the costal arch and the spleen was very definitely palpable. B P was 124/72. Urine, negative. Hb 75; W. B. C. 13,750; R. B. C. 4,930,000. Blood platelets 230,000. Bleeding time 2½ minutes; coagulation time 3 minutes; Wasser-

On July 27 the heterophilic agglutination test came back positive in a titer of 1-640. The patient ran a high temperature for over 2 weeks, and made an uneventful recovery.

#### CONCLUSION

1. The heterophilic agglutination test is a specific test for infectious mononucleosis.

2. Serum sickness gives a positive response, but can be differentiated from the above by the absorption test (Davidsohn).

3. The clinical aspects of the disease have been discussed.

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#### DISCUSSION

Dr. W. H. Newcomb: Dr. Isaacs has presented the symptomology, has shown the necessity of accurate diagnosis and has shown likewise the test for differentiation of this disease.

Infectious mononucleosis is an old disease that recently has been given a new name. Formerly, it was called glandular fever. The demonstration of the marked increase of mononuclear cells in this disease has lead to the use of term infectious mononucleosis. Slight interest was shown in this condition until Paul and Bunnell discovered that the serum of patients with this disease agglutinated sheep cells in high dilution. The differentiation of leucemia, of tuberculosis, of Hodgkins' disease and others from this disease is important as had been brought out by Dr. Isaacs.

It has only been since 1929 that there has been a test available for differentiation of this disease, making possible an accurate diagnosis. The test was run onto rather accidentally and was at first thought not to have necessarily any significance until it was shown that in infectious mononucleosis the agglutination would be positive with dilutions as low as one in 64 and up to 5,120, in some cases.

Likewise, it has been shown to be positive in cases of serum sickness. However, the dilution in serum sickness is much lower than in infectious mononucleosis. I understand it rarely runs over one in 64 in serum sickness, while it starts at one in 64 and goes up to 5,120 or more, in infectious mononucleosis.

This test alone possibly suggests something in reference to its etiology. One might conclude, inasmuch as there is a positive reaction in serum sickness, that this is likewise an allergic reaction rather than a specific disease. As you know, there is question whether infectious mononucleosis is a specific disease or whether it is an abnormal reaction on the part of the lymphathic tissue, although evidence would point to the fact that it is an infectious disease entity.

The test itself has been used in various ways by different workers. All have used the same amount of serum, the same amount of sheep cells. There has been a difference in the period of incubation. I think originally some of the workers used two hour incubation for this test, while others have used four hours, and it would appear that it has been standardized at four hours, and has usually been left over night in the ice-box and then incubated the following morning, whichever was more convenient.

The other point about infectious mononucleosis is the fact that most of these cases which have been reported have been more or less sporadic while, of course, epidemics have occurred. I could not find in the literature that I had available where tests were made on large enough numbers in the epidemics reported. The heterophilic agglutination test should be tried out during epidemics if that has not been done.

When the heterophilic agglutination test was brought out I remember seeing one case of multiple adenopathy that was thought to have tuberculosis. This case showed an increase in the number of monocytes, the patient was x-rayed and intradermally tuberculin tests were made, both negative. A diagnosis of infectious mononucleosis was made; the patient is now in good health.

Another case where the abdomen had been opened for appendicitis the retroperitoneal lymph glands were found to be enlarged. The patient had enlarged anterior, post cervical, and inguinal lymph nodes with a slightly red throat, pain in abdomen with rigidity. The blood count was characteristic of infectious mononucleosis and had the heterophilic agglutination test been used, operation would have been unnecessary.

I think it is important that accurate diagnosis be made in these cases, and I wish to thank Dr. Isaacs for bringing this subject before the section, because I think it is important that everybody know about it.

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## WOMEN AS SLAVES TO INDUSTRY

JOHN R. HARGER, S.B., M.D., F.A.C.S.

CHICAGO

The evolution of man, from the early cave type to the present peak of civilization, has held the attention of our scholars all through the years. One rather modern aspect of that evolution, that part which has enabled women to displace man, has apparently escaped their attention.

Any economic change in human progress, regardless of cause, has played an important role in any close study of man's development. A more recent popular pastime has been the investigation and discussion of those economic principles which brought about our present economic upheaval.

One causative factor after another has received its full share of criticism then only to be discarded. As far as the writer has been able to determine there is one gross discrepancy in our modern life which has escaped discussion. That discrepancy has been recognized by many as a major factor in the cause and a no less contributing element in the prolongation of the depression.

Myriads of remedial measures have been offered to correct the situation, but thus far only temporary stimulus and comfort have been the result. The largest single phase of human achievement which calls for the expenditure of money has to do with the establishment and maintenance of the home.

It is my purpose to discuss briefly one aspect



of modern life which reaches the confines of every home, in varying degrees and influences the lives, for better or for worse, of millions of our people. More often than not this aspect detracts greatly from the total of human happiness.

The emancipation of woman has held the attention of people for generations. Woman in industry, in professional and business life, has reached great proportions in recent years—and has thus developed unlimited potentialities along those lines. I am of the opinion that if this development is not curtailed it threatens to affect adversely the future destiny of this particular nation.

Our United States of America with their one hundred and twenty-five millions of people and the colossal melting pot of races and creeds is so vast that it cannot materially be affected except by those things which reach down to the fundamentals of the home. There is no one paramount disturbing factor, but this is one that affects, more or less severely, millions of our homes and thus cannot intelligently be ignored.

Thanks to our more thoughtful statesmen during the more recent years our melting pot is no longer heaped with scrambling humanity. The amalgamation of our foreigners is offering now opportunities for their American born descendants to assimilate both our ideas and our ideals.

The past one hundred years have revealed very startling changes in our mode of living. They have given us pleasures and opportunities never dreamed of by our ancestors. Many things that are commonplace today would have startled our people of even an half century ago. Many of these advances are so evident that one rarely questions them. They have become part of modern life. That all of these have been or will prove to be blessings can be seriously questioned. Women in industry and professional life is one type of advancement that should be seriously considered.

Great men and women through the ages have stood on the principle that the basic foundation of good government rests upon the substantial homes within a country. Homes where character and responsibilities of life are taught to be the most essential and the baser attributes frowned upon; where any influence which might

detract from such homes would be received with suspicion and alarm.

Previous to the World War the American home represented a cross section of the home life of nearly all nations. All too often since then the less desirable element of home life from the many nations has been landing on our shores; and not the higher strata of foreign family folk. Millions of those wives and mothers both real and prospective were forced into American industry at a payment wage quite incompatible with our native standard of living. This is what was withdrawing from those new homes all that remained for the development of character, honesty, and a love for their adopted country.

The dominant influence in every home has always been the mother—a fact too often ignored in our national life for several generations. The industrial revolution that has swept this country during that period and the emancipation of women through business and professional life, have taken out of and away from our homes millions of women. A few of them have succeeded in their chosen field, but they could, for the most part, have given the world a far more valuable contribution through the capacity of wife and mother.

It has been well said that statistics may be used to prove anything desired by the statistician. However a study of the figures relative to women gainfully employed makes evident some very pertinent facts. A review of the statistics relative to employment, unemployment, the emancipation of women from her slavery to man, to where she now sits as his equal or superior, reveals some very suggestive and instructive details. Millions in industry, thousands in the professions and hundreds in politics, each one displacing a man, thus depriving him of the opportunity of earning a living for himself and family.

In 1930 there were more than ten million women between the ages of fifteen and sixty-four who were gainfully employed. This number is an increase of about one and a half million from the preceding ten year period. If by any measure of values one can conceive of how 25% of the female population can be gainfully employed and for the most part away from home life, without thus undermining the foundations of our American homes, it must be based upon a new method of reckoning.

About 50% of those women employed or about five million are either single or have not reported the marital state. Eight per cent. of the total female population or about two million seven hundred thousand of the housewives are gainfully employed. The least important group of women working for a wage are those widowed and divorced and are represented by about two million three hundred thousand, or in excess of six per cent. of all women between the ages of fifteen and sixty-four.

No figures are available to show how many divorces have resulted from the employment situation, either because the husband fails to find a place for himself or where the wife becomes weary of supporting a household and desires further freedom and independence.

Reports do show that there has been a steady increase in divorces in all civilized countries except Japan, the United States maintaining the highest rate. In 1886 there were over twenty-five thousand divorces in this country. In 1916 one hundred and twelve thousand, an increase nearly four times as rapid as the increase in population. In 1929 there was one divorce in every 6.1 marriages. More than one hundred thousand children are affected by divorce each year.

Society has frowned upon conditions that are considered as slavery for women in the homes, but the millions of women slaves to American industry have apparently escaped notice.

With an excess of five million women working out a mere existence in our factories, how can we justify that proud claim of being the most prosperous of all nations with a standard of living above all others?

With approximately another five million women engaged in professional work, politics and administrative positions may we not assume that woman's emancipation may lead to the defeat of its own purpose. A survey of the future, in the light of the present and the immediate past should enable us to develop plans for the removal of millions of American women now imprisoned by industry. Place them and the coming generations in homes where natural mother instincts may hold sway.

The problem of economic adjustment has affected more or less severely every man, woman and child in this country. Every organization of whatever type has been forced to reconstruct

its program and curtail many of its activities. Those restricted programs and limited influences, especially those of educational institutions, will affect adversely the present generation of our youth. Again the need for the best homes with mothers to supplement the work so long carried by our institutions.

A century or less in the past the woman's principle ambition was to find a mate, establish a home, rear her children in such a way that a boy would be a brave soldier, an honest business man or a successful farmer. Every girl was to grow to be a faithful wife and a devoted mother. Most normal men sought and usually found a livelihood of a type that enabled them to maintain a home and support the children in it. Most men were self-respecting citizens and gave no thought to being a burden on society. They were loyal to their community, their state and their country. They taught their children to follow in their footsteps. Paupers were less numerous, criminals were rare, and faith in one's land and the future was firm. Human happiness was far greater then than it is today.

As the decades have come and passed women found their way into industry, where each replaced a man. They found professional avenues alluring in which each one could make a place for herself, again as a substitute for a man. And, only during our present generation, have they found their way into politics. Their work in politics has not measured up to general expectations because political life seems no nearer the ideal than before women suffrage seemed a possibility.

Every woman who can play an important part in professional, business and political life might with even better success fill a more important breach in the life of a worthy man and the lives of healthy children.

Visit if you will the homes and working conditions of our factory women whose existence is not far removed from slavery. See these women whose finer sensibilities are benumbed and distorted to such an extent that they very early are made unfit for their normal place in life. We may well ask ourselves if this is civilization or the result of it? Why are things thus? Why have our people been unable to avoid or remove themselves from this maniac-depressive economic state and go forward along normal lines? What fundamental factors have given us such a wide-



spread social, political and economic mixup and universal loss of confidence and faith?

Inborn in all animal life is that physiological urge which is necessary for the propagation of any particular type. Man is no exception. Most normal humans when approaching adult life, have visions of finding a mate and establishing a home and in it exhibiting that love and devotion that comes only with maintaining a home and the rearing of little children.

In our present state of civilization there are millions of our youth facing certain disappointment. They will be compelled to forego or to stifle that major ambition and lead an unnatural existence. When those millions go forth seeking pleasure and satisfaction that will substitute for that which has been denied them, only those whose paths lead to such experiences can relate the details. That this situation does exist and offers a major social and economic and even governmental problem should cause it to receive more widespread recognition.

If man is to play an inverted role, rock the cradle, stir the larder, and master other household arts, woman must be prepared to go forth to battle and assume the responsibilities of the major affairs of state. If however we are to go forward as in the past, along recognized paths that have been trodden since the dawn of history, then the complexities of modern life must give way in part to more abundant human achievements and happiness through more familiar avenues.

Are the leaders in industry blind with respect to the ultimate possibilities of women in business and the factory? Will they continue to maintain this cheap labor as a guarantee against the many outlets for manufactured goods?

Those millions of women with a wage incompatible with decent living are unable to purchase even the bare necessities. Corporation heads continue to ignore the fact that cheaply paid labor is able to buy merely the essentials. Yet when a person is properly compensated he spends his money, not only for his immediate requirements but for all available luxuries.

Are there those who will not agree that a home-making mother has a full time job? Can a housewife and mother be gainfully employed and still do justice to her home duties? Can her influence be augmented by the experience of being a stenographer or factory worker, by

holding some political office, or by being in some professional activity?

Assuming that a woman can be a better wife and mother when her entire energies are directed along those lines which are essential to home making, rearing of children, creating character and devotion in them and in her husband let us hope that we may see more of that.

The effects and their various ramifications of this varied type of living on millions of our homes cannot be discussed in this article. However, the present and future generations of our children will reveal many facts yet to be studied. If human wisdom were as free from fault as it might be, if there were less interference with the natural homing instinct, the birth of our children; and if the same thought and effort and expenditure of money were directed toward care and education of those born in the homes, as is now, more or less wasted in every conceivable type of production control, in the home, in the pig sty and in the fields, there would be a tremendous increase in human happiness.

The present generation of society has endowed woman with an emancipation in excess of any previous one. Has she because of this realized a more full and complete life? After all, what are the secret ambitions of the human female? Do they differ so greatly from her forebears? Or does her environment and daily contacts stimulate those desires that call for a life so different?

Woman's inhumanity to man is deserving of serious consideration. Man's gallantry, his love and his admiration for woman have prompted him to give her the advantage in all human relations. Now she is gradually displacing him. She has taken his job, crowded him out of his profession, is gradually easing him out of political office, denies him a home and has gone far in her quest for alimony. Yet she seeks to maintain his respect and consideration.

No sane man dares question woman's mental status, but there are many who will not agree as to her ability to replace man in all avenues of life. I say all this reservedly, for are there any avenues she has not invaded or made attempts to invade? We will concede the fact that women have a sphere in professional life. It is particularly true where the sick and little children are concerned. That all other professions

cannot be completely maintained by men will challenge the best of thought.

Would that we have the answers to the many questions for in them lies the possible answers or solution to this problem.

Will industry continue to employ millions of women at a wage varying from eight to twenty dollars a week and thus force millions of men and fathers to walk the streets and highways dejected and disgraced? Will industry continue to force the same millions to live unnatural lives, thereby fostering immorality, infanticide, crime and misery? Should the women of this nation be held in virtual slavery to industry while the men idle away their time and substance lining the byways of this country with their human wreckage? Should we hope that industry continue to profit by the life blood of those unfortunates and the buying power of those one step removed from that horrible spectacle?

Woman's superiority we freely admit when she is within her sphere, that of home making, rearing of children and developing those finer qualities so essential in human character. However, that she is inferior to man when placed amid the larger activities where brawn is as essential as brains, should be conceded.

I hope that some of those better able to, would take up the fight to keep man in a man's place and to show woman her responsibility to future generations. In the opinion of one who has personally observed the facts presented, and has been in professional life for a sufficient length of time to learn how this question effects human relations, there is no phase of our national life more vital to the welfare of our country.

Further discussion of this subject is solicited. Favorable comment will emanate from those who are sincerely interested in our future. Adverse criticism will come from those whose lives have seemingly been broadened by strange avenues that have lead them to success.

May we hope that the leaders of American life and thought will lend their influence to bring about a change?

And finally, is there any better means of re-establishing a more stable social, political and economic condition than to remove millions of our women from American Industry and to create more and better homes?

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## PROBLEMS ENCOUNTERED IN THE INTERPRETATION OF MECHANICAL AND LABORATORY AIDS TO DIAGNOSIS

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PEORIA, ILL.

The development of clinical medicine in the last two decades has produced an ever increasing number of mechanical and laboratory aids to diagnosis. To keep abreast of the various advances made it has been necessary, first for the clinician not only to familiarize himself with these advances but also from time to time to keep himself fully informed as to their value, and secondly to purchase expensive apparatus and to equip an adequate laboratory to carry out the various tests devised. To many practitioners this has been a physical impossibility because of the expense, the pressure of business and the rapidity with which new developments occur.

Fortunately no practitioner is so secluded in these days of hard roads and quick transportation that he cannot contact reliable laboratories, thus availing himself of the required information. Unfortunately, however, some are not able properly to interpret the findings obtained nor to evaluate their true importance in arriving at a diagnosis. Especially is this the case when the information comes from laboratories and technical advisors not sufficiently skilled in up-to-date methods to insure reliability of results.

It is amazing to see the credulity with which reports are accepted from laboratories with mechanical instruments poorly conditioned, or from those using impure chemicals purchased at the corner drug store or from unreliable chemical houses, and from those manned by physicians and technicians with such poor scientific ability as to make the most foolhardy question the results obtained. On the other hand infallibility does no exist even with perfect equipment and among the most skilled operators and technicians. Laboratory reports should be accepted only from reliable sources and used for diagnostic conclusions only in conjunction with a good history, a painstaking examination, and an intelligent review of all possibilities connected with the case in question.

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Read before Section on Medicine, Illinois State Medical Society, May 20, 1936.



In order to be more specific I shall discuss briefly a few mechanical and chemical aids to diagnosis. The metabolimeter has been sold in increasing numbers each year. The salesman can easily convince the uninformed physician as to the ease of operation and the accuracy of results obtained with his particular machine, but the physician does not have time to operate his own machine and reliable technicians are not made in a day.

Four requisites contribute to satisfactory results in basal metabolism. One very important essential is the use of a scientific machine, one which records the amount of oxygen consumed during a long or a prolonged length of time, and not one which records the length of time required to consume a given amount of oxygen. The latter may give satisfactory results for a normal or a sub-normal but for a hypernormal the reliability of the result is destined to vary inversely with the degree of hyperthyroidism existing; the higher the degree of hyperthyroidism present, the shorter the length of time required to consume the given amount; and the shorter the time, the less reliable the result. The second indispensable requisite is the complete conditioning of the apparatus before each test; the third is the proper preparation of the patient; and the fourth, the employment of a competent technician or operator, one who is mechanical enough to understand the mechanism as well as the procedure, intelligent enough to give each patient minute and persuasive instruction, and self confident and positive enough to obtain from each individual full co-operation. The technique is more difficult than one is led to believe and errors of 10% to 20% may be made, especially by beginners. Even in the best hands a possible error of 2% or 3% may be expected. Also it must be remembered that there are rather wide fluctuations in the daily metabolism of certain individuals. For example the first few tests may be 10% to 20% too high and some normal individuals consistently show rates 10% to 15% or more above or below the normal. These various sources of error may partially neutralize each other, but if they all happen to fall in the same direction the result will be far from accurate. A strict adherence to the basal metabolism test as an index of diagnosis may lead to erroneous conclusions, first because the test does not al-

ways give the true metabolic rate, often on account of technical errors, and second because the true basal rate is not always an indication of the correct diagnosis. It is seldom that we should allow any single laboratory test to outweigh a mass of clinical evidence. There are certain conditions according to DuBois in which basal metabolism is frankly misleading:

1. Cases of myxedema and cretinism frequently show a normal rate if they have been taking thyroid while still retaining most of the phenomena of the disease.

2. Exophthalmic goiter patients in remission stages may be considered pathognomonic in spite of normal tests.

3. Certain anemias, fever, or other factors tending to raise metabolism may combat a tendency toward an abnormally low metabolism.

4. Cases not having an increased metabolic rate have been diagnosed as exophthalmic goiter by excellent clinicians.

5. A considerable number of suspected hypothyroid cases fail to show a low rate and, conversely, two-thirds of the suspected hyperthyroids fail to show an increased metabolism.

Some of this last group may be cases of psychoneurosis, effort syndrome, or congestive heart failure in which the rate may be as high as 20% to 40% above normal. If the rate is as high as 50% or more above normal without technical error, thyrotoxicosis is almost certainly present.

In addition to the cases where the basal metabolic rate may be misleading, one should consider the influence of other endocrine disturbances which at times influence the rate. In this field there is no great uniformity of results. There is some evidence of an increase in metabolism in the early stages of acromegaly, although only slight evidence that the secretion of the pituitary gland is concerned with the normal rate of cellular combustion. Also the metabolic rate is variable in disease of the adrenals. Certain anemias, leukemia, and polycythemia often show increased rates.

Considering the above clinical comments one can better evaluate the importance of the basal metabolism. According to Crile it is a valuable but not a specific test for the presence of hyperthyroidism. It has considerable value in the differential diagnosis of borderline cases, but is of little help in the determination of the opera-

bility or prognosis of the individual case of hyperthyroidism.

The second mechanical aid to diagnosis to be discussed is the electrocardiograph. The electrocardiograph is not in common use by the general practitioner both on account of its initial expense and the difficulty of interpretation. These factors should not deter the physician from attaining sufficient familiarity with electrocardiography to know in which cases its use is indicated and the proper evaluation of electrocardiographic findings in hooking up symptomatology, diagnosis and treatment.

Electrocardiographic records permit exact identification and differentiation of disturbances of cardiac rhythm and of cardiac conduction as well as identification of paroxysms of rapid heart action and of other abnormalities. They do not give reliable diagnostic evidence of valvular lesions nor of diseases of the pericardium. To venture a positive diagnosis of a certain type of lesion from the electrocardiograph alone is an unsound practice, even though in occasional instances this seems to be possible.

Electrocardiograms may be perfectly normal even in the presence of serious heart disease. About one-fourth of all cases of angina pectoris show an apparently normal heart by all methods of examination, yet the most valuable evidence of underlying coronary disease is supplied by the electrocardiogram.

Electrocardiography is unquestionably a valuable adjunct to other clinical methods of diagnosis in cardiac disease, but it should be remembered that, like other specialized branches of medical science, it is frequently evaluated by persons whose acquaintance with the subject is only cursory.

In addition to metabolimetry and electrocardiography, roentgenology, bacteriology and chemistry have their place in this discussion. Roentgenological apparatus has reached such a degree of perfection that any good technician can produce good roentgenograms if the proper technique is followed. Correct interpretation of films, however, demands a good foundation in anatomy, pathology and physiology as well as a sufficiently long period of association with some master of the art in addition to a clinical association in order to check up the correctness of his roentgenological diagnoses. The consultation

of the roentgenologist with the clinician and vice versa is of the utmost value in diagnosis.

As to bacteriology and chemistry unfortunately expert bacteriologists and chemists are rarely found outside of the larger clinical centers. It is usually necessary for the clinician to send patients directly to laboratories where this service can be obtained or so to familiarize himself with the proper technique of collecting and preserving specimens in such a way as to insure their arrival at the laboratory in good condition. A significant positive blood culture in a case of suspected bacterial endocarditis is of great diagnostic value, but it takes a skilled bacteriologist to produce the evidence.

In using diagnostic mechanical and laboratory aids, I shall mention five conditions with illustrative examples which may either aid or lead us astray:

*First:* There are certain cases where only these aids alone give the conclusive evidence. Daring indeed is the clinician who diagnoses intraventricular block, a condition in which there are no characteristic signs, without depending on the pathognomonic electrocardiogram. Occasionally the electrocardiogram gives definite aid in the differential diagnosis between upper abdominal lesions and coronary thrombosis. The presence of tubercle bacilli may furnish conclusive evidence in certain obscure pulmonary infections. A high blood uric acid may give the final diagnostic clue in a certain type of the arthritides.

*Second:* Laboratory findings and mechanical aids have proved to be negative where a clinical diagnosis can be well established. I have seen a chronic kidney-shaped ulcer on the leg with repeated negative serologic tests respond promptly to antileptic treatment. I have had the chagrin of muzzling a diagnosis of amebic dysentery where repeated stool examinations failed to show *entameba histolytica*. I have not hesitated to diagnose exophthalmic goiter in certain cases where a normal metabolic rate was obtained.

*Third:* There are those cases where we obtain conflicting laboratory reports. You have all had the experience of obtaining both positive and negative serologic tests in suspected lues. Basal metabolic rates may be so conflicting that careful analysis of the technique and conditions surrounding the test must be brought into play.



*Fourth:* A failure to use laboratory and mechanical aids leads to error in diagnosis. I recall particularly three cases treated for diabetes mellitus on the basis of sugar in the urine. Two of these were rejected for life insurance and one lost his position in a factory. All three had normal blood sugars and were cases of renal diabetes.

*Fifth:* Laboratory aids may give positive diagnostic evidence leading to clinical errors in diagnosis. I recall a case of a woman 59 years of age who suffered a severe gastrointestinal hemorrhage. Roentgenograms of the stomach showed a large filling defect on the greater curvature of the stomach. The films were interpreted by three good roentgenologists as carcinoma. At operation no carcinoma was found. The operating surgeon had the good surgical judgment to recognize that the filling defect was due to a large clot of blood in the stomach and promptly closed the abdomen. An uneventful recovery ensued.

Many more examples could be cited from my own experience but I am sure you have all had similar diagnostic conflicts and the purpose of this paper is merely to emphasize the various diagnostic aids and errors in a brief way.

The final solution of the use of mechanical and laboratory aids must be left to the good judgment of the clinician. He has open to him three methods of procedure. Reports may be either accepted or rejected, or confirmation requested. One should not be seduced in diagnosis by mechanical and laboratory reports. Yet neither should one forget that these methods are not only important contributions to medical science, but also beacons of scientific progress. Continued investigation and elaboration of the various mechanical and laboratory procedures will result in much more positive knowledge and in more accurate diagnoses.

#### JELLY BELLY (PSEUDOMYXOMA PERITONAEI) AND ITS ULTIMATE DEVELOPMENT: (REPORT OF THREE CASES)

WALTER W. VOIGT, M.D., F.A.C.S.

CHICAGO

Pseudomyxoma peritonaei, the growth of tumor-like jelly masses on the peritoneum, is a secondary affection. The cause is usually to be found in the appendix or ovary, though cases

have been reported in which the primary cause lay in a cyst of the abdominal wall, developed from the remains of the ductus omphalo-entericus, in one case, and in another, a ruptured enterocystoma constituted the starting point of the peritoneal affection. Probably myxomatous formation can occur in any organ containing mucus-producing cells, and by rupturing cause a pseudomyxoma peritonaei, but it is necessary that there be aseptic stagnation, as in the appendix which is closed at its base, and in the ovary which normally produces cystic structures. In both cases the walls are thin and rupture easily under pressure from within or without.

Pseudomyxomatous formations have often been observed at the same time in ovary and appendix, therefore both organs should be in-

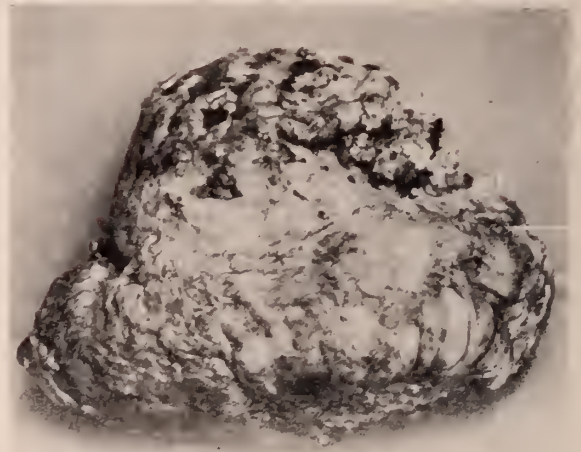


Fig. 1. Pseudomyxoma tumor after successful removal of pseudomyxoma peritonaei ex appendice.

spected at operation even when the origin of the affection in one organ seems certain. Definite recovery can be expected only after thorough removal of the original focus. The gelatine-like secretion of the tumors is produced by the epithelium which, in addition, perishes in many cases. The prognosis is set down as unfavorable, since after a short recovery there ensues a spreading of the tumorous growth. The growth is usually limited to the abdominal cavity, but it can spread through the lymph channels into the diaphragm. The patients at death present a type of cachexia. The prospects are considered unfavorable, because the efforts of the peritoneum to absorb or to organize the tumors impairs its function. A peritoneum in that condition is histologically not recognizable as a

peritoneum. It loses its epithelial character, assumes the character of connective tissue, and cannot fulfill its defensive function.

If the appendix is the primary seat, we first find a mucocele, which ruptures after an overproduction of mucus, so that the contents enter the abdominal cavity. There is on record, however a case of H. Gangl<sup>1</sup> in which continuous



Fig. 2. Cross section of pseudomyxoma tumor.

mucus production ensued without formation of a mucocele from an inflamed ruptured appendix. One of the cases to be discussed here seems to be very similar.

If the ovary is the primary seat, it is a case of cystadenoma pseudomucinosum with a similar emptying of the contents into the abdominal cavity.

It has to be kept in mind that not only dead mucus is emptied into the abdominal cavity, but living cells as well, and these are capable of multiplication. They produce the same secretion as the primary tumor and are, therefore metastases by implantation, distinguishing themselves from those of malignant tumors by not spreading through blood- or lymph channels. Neither are they attended by infiltrative growth. They are comparable to artificial tissue cultures.

When the primary tumor is removed, reconstruction can take place depending upon the vitality of the implanted cells and the power of resistance of the peritoneum. The latter tries by absorption and organization to become master of the invaders. If it does not succeed, further spreading occurs. The function of the peritoneum, however, is always impaired, as shown

in a case reported by Schley<sup>2</sup> in which strangulation of an umbilical hernia took place four months after operation for pseudomyxoma peritonaei. The hernia was operated upon five hours after the strangulation. The intestinal loop showed only fresh congestion, no injury of the serosa. Nevertheless, death followed thirty-six hours later, due to streptococcus peritonitis. No intestinal gangrene was found at post-mortem. The once strangulated loop could no longer be recognized as such. The visceral as well as the parietal peritoneum had largely thickened and turned gray, although it remained smooth. It had lost its original character and lacked the capacity to overcome a slight infection.

During the absorption of the alien cells there ensues an overflowing of the body with foreign proteins, and eventually a proteinogenic cachexia takes place. Thereby otherwise healthy cell material is absorbed, whereas in the case of cachexia the result of malignant tumors, toxic metabolic products are absorbed. In the case of pseudomyxoma with appendicular as well as ovarian origin living cells are implanted on the peritoneum as is evidenced by the nodules appearing on the peritoneum. The prognosis of pseu-

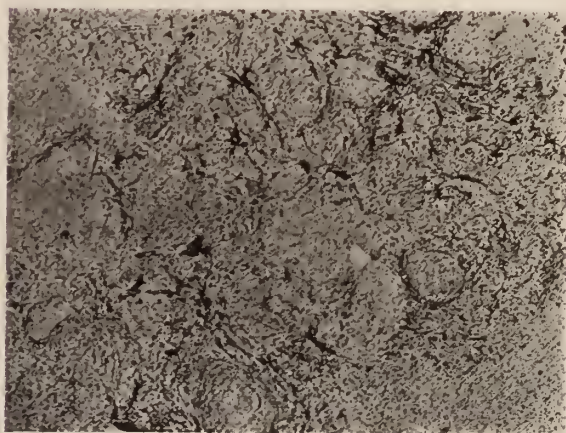


Fig. 3. Microscopical section of pseudomyxoma tumor.

domyxoma ex appendice is regarded as better, since the invading cell material is less in quantity and shows lesser tendency to grow. The appendicular cells are normal body cells. The cells from the pseudomyxoma ovarii, on the other hand, are genuine tumor cells with their capacity of unlimited autonomous growth independent of the matrix.



The cases here presented date from three to six years. Two of them healed without a relapse. In one case which was of appendicular origin and therefore prognostically more favorable, a local recidivation of tumorous growth occurred. A myxomatous peritoneum after cystoma of the ovary, however, healed readily. In both cases a second operation for postoperative hernia or fistula had to be done and freedom of recidivation could be ascertained.

### CASE REPORTS

Case 1. A woman of thirty years had intermittent pains in the abdomen following a normal confinement four years previously. These pains occurred once a month, often during menstrual period but also independent of it. They spread over the whole abdomen, sometimes centering in the region of the appendix, and again radiating to the right leg. The pains were often combined with nausea and vomiting. The duration was irregular, sometimes the pains lasted two days. She often had to remain in bed and was always constipated, especially during the time of the attacks. On admission to the hospital she was especially sensitive to pressure at McBurney's point, and showed defense musculaire. Abdominal reflex was absent on the lower right quadrant of the abdomen. The leukocyte count was 7,500. The case was diagnosed as chronic appendicitis with acute exacerbations and probably stricture.

Operation disclosed a short, thick appendix, 6x1.2 cm., with the cecal opening closed. It was distended by mucus and the walls were thin. Near the cecal opening there was a small perforation, in vicinity of which the peritoneum of appendix and ileum was covered with pea to bean sized mucous tumors, which could be wiped off easily.

The patient is now, after more than three years, free from symptoms.

Case 2. A forty-year-old woman complained of severe pains in the abdomen and discharge for six months. The abdomen was sensitive to pressure at all points, especially in the left lower quadrant; here muscle tension took place upon touch. After a dose of morphine a tumor-like resistance could be felt at this spot, while the rest of the abdomen was less sensitive. Vaginally there was the same resistance, and a painful enlarged tube was felt. The right side was scarcely sensitive. Leukocyte count was about 12,000.

Upon a tentative diagnosis of pyosalpinx the abdomen was opened. Masses of frog egg-like deposits were disclosed on the peritoneum, especially in the pelvis. The left tube was grown together with an almost fist-sized and apparently abscessed ovary. Ovary and tube were extirpated and the masses of mucus thoroughly removed. A rubber tube and two strips of iodoform gauze were inserted for drainage, because the contents of cystoma looked very much like pus.

The progress was complicated by high fever during the first two weeks. No germs were found in the

blood culture. Tube drainage was only serous. After three weeks the patient was discharged from the hospital with the incision closed.

A year later the patient was re-laparotomized because of a hernia, the size of a small fist, which had developed at the site of drainage. On this occasion the abdomen was re-examined and found free of pseudo-myxomatous growths.

Case 3. A girl, twenty-two years of age, presented herself for examination with symptoms of an acute appendicitis with perforation. She gave a history of attacks of pain in the abdomen which sometimes centered in the region of the appendix. With the present attack, after three or four days of increasing pain in the lower right abdomen and nausea, there was sudden sharp pain followed by relative painlessness, but there was vomiting. On examination it was noted that the lower abdomen from naval to symphysis was tense and quite sensitive to pressure, and showed comparative dullness on percussion. This was diagnosed as a peritoneal exudation.

Upon opening the abdomen copious jelly masses were found on the visceral peritoneum of pelvis and lower abdomen. The parietal peritoneum was clear, as were both peritoneal layers of the upper abdomen. The appendix was 8 cm. long, hard, and the size of a thumb. On its anterior wall, not far from the cecal opening, there was a small pea-sized opening in which mucus was visible. The vicinity of this opening showed deposits of fibrin, as did an adjacent part of the ileum. On dissection the appendix showed a thick wall and only a very narrow connection with the cecum. Signs of fresh inflammation were not visible. The appendix was distended by mucus. According to all indications, it was a case of former appendicitis, which had led to stricture of the cecal opening and continuous production of mucus from the ruptured opening. Later there must have resulted a closing of the opening by slight adhesions to the ileum. Her most recent attack, which gave the impression of an acute appendicitis, had apparently resulted in a congestion of mucus, increased pressure, breaking of the adhesions and a renewed emission of mucus into the abdominal cavity.

The patient recovered, but returned after a year for re-examination because of pains in the right lower abdomen, and constipation. A tumor-like formation was found in the region of the cecum, either due to adhesions or renewed myxoma formation. At operation, the tumor and the section of the colon from which it arose were removed. Figs. 1 and 2 shows the specimen from the outside and a cross-section. Macroscopically, jelly-like parts could be seen in the tumor. The microscopic examination showed the following: The tumor located on the outside of the intestinal loop consists of the connective tissue rich in young cells. In the connective tissue there are many cavity-like formations which are empty since the mucus fell out. They are surrounded by a capsule of young connective tissue which sometimes emits prolongations into the cavity. There are no epithelial cells visible.

*Discussion.* In no case was the diagnosis of pseudomyxomatosis peritoneaei made. The cases were operated upon as acute or chronic appendicitis and ovarian tumor. In spite of the acute clinical symptoms, perhaps the low leukocyte count should have indicated the origin from a condition not acutely inflammatory.

The first appendicular case was operated at the very beginning of the myxomatous growth, so that the small tumors could be completely removed. The prognosis, therefore, was favorable from the beginning, and the patient has been clinically cured for almost four years.

That quick and definite healing followed the cystoma case is really astonishing, since according to reports hitherto recorded recurrence is the rule. In this case freedom from recurrence has lasted for six years, so apparently the removal of the myxomatous growths was completely successful. Perhaps also the presence of fever in the beginning contributed to a favorable result. The fever reaction was ascribed to the drainage, which was resorted to because the ovary gave the impression of abscess formation, for older cystomas often contain numerous pus cells, and in this case a secondary infection from the tube was assumed. Drainage is usually advised against after operation for cystoma with myxomatosis peritoneaei, because the peritoneum has little power of resistance and the drainage can be the source of a secondary infection. The peritoneum shows little tendency toward adhesions. It has lost its epithelial character, appears more like connective tissue and cannot easily overcome infection. In this case, too, almost two weeks were needed to overcome the apparently slight infection, and recovery was achieved at the price of a postoperative hernia only. But perhaps what was in itself a slight infection, stimulated the peritoneum to such an extent that the myxoma could be completely conquered. I call to mind Hoehne's successful stimulation of the peritoneum by camphor oil injections into the peritoneal cavity previous to abdominal operation for cancer of the cervix, where, in older cases, numerous germs are always found in the parametrium. Nevertheless, drainage is a risk, and certainly less dangerous stimulation of the peritoneum can be accomplished by x-ray treatment and other means.

The second appendicular case should have had

prospects of undisturbed healing. As a matter of fact, a recurrence did not arise from the peritoneal dissemination of the growths but from the region of the original focus. This pseudomyxoma showed a tendency toward local growth which seemed to be not far removed from transition to malignancy. In this respect the case resembles one reported by O. Wallis<sup>3</sup>, which was a pseudomyxoma clinically malignant. In that case there were found two ovarian cystomata that did not rupture. The microscopical examination showed an epithelium with tuft-like protuberances and at places a tendency to something like adenopapillary growth, with polymorphy of the cell nuclei. The patient had to undergo another operation a year later for bowel obstruction, at which time small and large tumors on intestine and omentum were found. Histologically, there was found a cylindrical, mucus-producing epithelium with variations in height and size of the cells, together with widespread polymorphy of the cell nuclei and a tendency to many-tiered growth.

#### SUMMARY

1. In cases of pseudomyxoma peritoneaei both ovary and appendix can be the starting point of the process, therefore both should be inspected even though it is evident that one is the seat, since a simultaneous affection both organs has been found.

2. The pseudomyxomatous deposits should everywhere be carefully removed to aid the peritoneum in the work of absorption.

3. If much pseudomyxomatous material has to be absorbed, proteinogenic cachexia can result.

4. The function of the peritoneum is always impaired by resorption and organization of the myxomatous masses. It is inclined to assume the character of connective tissue, and cannot easily resist infection.

5. For this reason, drainage should generally be avoided, since it might cause a secondary infection.

6. After treatment by use of the x-ray is advisable.

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## TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA WITH IODINE POWDER

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One of the most difficult problems the otologist has to contend with is the treatment of chronic suppurative otitis. Among the many methods of treatment are irrigation with various solutions, zinc ionization, therapeutic rays of various types, installation of alcohol, ether, the various dyes such as mercurochrome, acri-violet, acri-flavine, and many other drugs too numerous to mention. About irrigation I shall speak later. Zinc ionization has been largely given up as being of no value. X-ray, ultraviolet ray and diathermy have not come up to expectation. The dyes stain the tissues to such an extent that it is impossible to differentiate the normal from the pathologic. Ether is painful, especially when it reaches the pharynx through a large perforation.

I am sure that all of you have used one or the other of these therapeutic agents at some time. At any rate this has been our experience and at the present time we are using the powder treatment. The powder treatment is not new or original with us. Politzer in his text-book published in 1908, mentions arsenic powder in treatment of certain types of middle ear suppuration. Boric powder, bismuth, aristol and many others have been used. Lederman in 1930 published some astounding results with (Sulzberger) iodine powder.

We have used this in 125 cases over a period of 4 years with satisfactory results. The method of use is practically that described by Lederman.

Before going into the treatment a brief review of the anatomic-pathologic considerations is necessary.

The relation of the eustachian tube to the anterior portion of the middle ear is of impor-

tance. Many of the perforations in the anterior inferior quadrant of the drum are caused by ascending infections through the eustachian tube caused by pathology in the nose, adenoids, pharyngitis or tonsillitis. The discharge is usually but not always mucoid in character in these cases.

However, the prognosis is best in this type of pathology.

The close proximity of the epitympanic space to perforations in Shrapnell's membrane anteriorly and that of the antrum to perforations posteriorly need only be mentioned. These perforations, especially if small or covered with crusts, are easily overlooked and are most dangerous, often causing intracranial complications.

The medial boundary of the middle ear and its relation to the promontory, round and oval windows, facial and chorda tympani nerves must not be overlooked. Perforations here may lead to a fistula and labyrinthitis.

Last, but not least, the fact that the mucosa of the middle ear is the periosteum of the bone is of prime importance. Polypi and granulations are nature's protection to the bone but should be removed so that a healthy mucosa may be regenerated.

What is the definition of chronic suppurative otitis media? Many cases show symptoms of chronicity in the acute stage such as formation of polypi, granulations or fetid discharge, but in general, one may say that a discharging ear of from 3-4 months duration may be considered chronic.

*Propylaxis.* All chronic suppurations of the ears begin as acute except in lues or tuberculosis and should be cured in the acute stage when a simple mastoid operation is usually sufficient. A patient who has had a running ear for from 6-8 weeks is advised to have a simple mastoidectomy. If this could be done there would be very few chronic otorrheas. Scarlet fever otitis with its extensive destruction may occasionally be an exception.

Very often operation is refused by the family or advised against by the family physician.

Patients who come into the clinic or office go through the following routine:

1. A careful examination of the nose and throat for deflected septa, sinus disease, infected tonsils, pharyngitis or adenoids.

2. A routine hearing test with the audiome-

ter and tuning forks. This should be repeated at intervals.

3. In case of vertigo, nystagmus and other symptoms of labyrinthian irritation, the caloric and Barany rotary tests, as well as an examination for Rhomberg and past pointing.

4. A general examination by an internist.

5. Examination of the drum for location of perforation, presence of polypi or granulations.

6. Bacteriologic study of the secretion.

7. Wassermann and tuberculin tests.

8. X-ray of sinuses and mastoid.

When abnormal conditions are found in the nose or throat these are taken care of by treatment or surgery.

The patient is then instructed to come in daily for the first week. The ear and canal are carefully cleaned out and a wick of xeroform gauze inserted. This has the antiseptic properties of iodoform without the objectionable odor.

At the same time the patient's nose is treated with 2% cocaine or adrenalin packs followed by oil sprays. The ear is inflated, thus forcing the secretions out through the perforation and improving the patient's hearing.

The throat is sprayed with a mild antiseptic solution to remove any secretion and a solution of phenol and ephedrine, each 0.5% in liquid alboline is applied to the nasopharynx with a curved syringe.

*General Treatment.* The patient is given cod-liver or haliver oil, iron and a diet rich in vitamins.

At the end of the first week, the ear will be considerably cleaner. The patient then comes in every 3-4 days. The nose and throat treatment is repeated and all ear secretion thoroughly removed with peroxide and alcohol and then dried.

✓ If no polypi or granulations are present the iodine powder is blown in. For the first 3-4 weeks the weak or 1% iodine powder is used and then the strong or 2% is applied. In large perforations the powder gains easy access to the middle ear. In smaller ones the powder may be applied by means of a canula through the perforation and if this is impossible the opening is enlarged.

If the ear remains dry, the patient is instructed to leave it alone between visits. If it becomes moist he cleans it with cotton and inserts a few drops of boro-alcohol and a strip of gauze.

No irrigation is permitted as it macerates the tissues and has a tendency to keep up the discharge. Many cases treated in this manner have cleared up when the dry treatment was instituted.

Of the 125 cases treated 55 have been dry for from 2-4 years, 32 were improved and 38 showed no change.

The cases reported are those of uncomplicated suppurative otitis media.

Those showing symptoms of cholesteatoma, labyrinthitis, facial paralysis or introcranial complications were considered operative.

A chronic running ear is not in itself an indication for a radical mastoid operation. The patient cannot be given the assurance that the ear will become dry and the radical must be employed only as a life saving measure.

✓ Since we have used the powder treatment, the radical has become almost a rarity and in many cases a modified operation has proved sufficient.

It not only preserves the hearing but is not nearly so dangerous.

Probably the percentage of cures would be larger if many patients were not lost track of. The secret of the treatment is thorough cleansing of the ear so that the powder may reach the pathology. Filling up the canal with powder is of very little value.

Most of our cases treated showed improved hearing, lessened discharge and odor.

30 N. Michigan Avenue.

## DISCUSSION

Dr. Walter Stevenson, Quincy: I am sure that we all agree with Dr. Christoph that cases of suppurative otitis media at times present a difficult problem, and sometimes require niceties of judgment as to when to use surgery. Until about two years ago when my attention was called to the iodine powder of Sulzberger by Dr. Joseph Beck's article, I felt that little could be done for a great many of these cases. Since I have been using the iodine powder I have been astounded at times by the rapidity with which many of these cases clear up. I am keeping a record of these cases and intend to present the analysis of them at a future date. It is, in my opinion, one of the best treatments, and I try it on every type of chronic suppurative otitis. It is of course extremely important that the treatment shall be as outlined by Lederman.

I agree with the essayist in every particular regarding chronic cases. Recurring attacks of pain in a chronic ear, I feel, constitute one of the most important indications for a radical mastoid operation. The statement that "acute suppurative ears should have a simple mastoid operation if discharge persists for from



six to eight weeks" I would modify by the statement that an acute discharging ear with a persistent, copious discharge and positive x-ray findings, and which showed no signs of abatement, should have a simple mastoid operation even without complicating symptoms. Other cases will clear up under conservative treatment even though the discharge persists for two or three months. I quite agree that acute cases should not be irrigated in the early stages of the disease. If the discharge becomes thick and tenacious, I believe that gentle irrigation of the canal provides more adequate drainage. Routinely, following incision of the drum, I permit the ear to discharge without any treatment whatever. Most of them will clear up in a week or ten days, following which a careful record of the hearing should be made until one is assured that there will be no residual deafness as a result of adhesive processes.

I have enjoyed this presentation very much, and I am glad to know that Dr. Christoph is inclined to conservatism in treatment of chronic cases. Radical mastoidectomy is very seldom indicated; it surely results in almost complete deafness in the average case, and this alone constitutes a contra-indication to operation if the ear can be treated conservatively with safety.

Dr. A. B. Middleton, Pontiac: I agree with Dr. Christoph in everything except three things. I think it is a mistake to inflate an ear and run the risk of blowing infection back into the mastoid through the aditus ad antrum. I think it is a mistake to put foreign substances into an infected ear, like peroxide of hydrogen, for the same reason, and to operate and open the mastoid after five or six weeks, unless you make a smear and find breakdown cells is also a mistake. If there is no bone cell destruction, almost all ears will get well in a reasonable length of time if the ear is kept dry and very clean without using irrigation.

Dr. Joseph C. Beck, Chicago: A few years ago when Dr. Lederman of New York visited me I was preparing a paper on conservative treatment of chronic suppurative of the middle ear, which I knew would cause a lot of discussion, but I thought I had discovered something that was a secret. I found some iodine dusting powder that a man (otologist) was using in Chicago and was not telling anybody about. I got hold of some of this powder and found the action was different from that of anything else I had ever used. I selected cases, as Dr. Christoph mentioned, particularly cases having no evidence of necrosis in the superior part of the drum gave the best results. When Dr. Lederman came through Chicago some time later he said that that was the powder he had previously recommended. I did not know that. I was surprised at the results following its use.

I think the last speaker said a mouthful about the use of a remedy that has the property of forcing its way into places where it is not wanted. I do not use peroxide of hydrogen. Blowing anything into the ear is not so good, but if done as Dr. Christoph does it, I see no objection. He left out one point; in eliminating secretion from the attic or from the eustachian tube, you can often by means of capillary suction clean the ear preparatory to the use of iodine powder. This

home made powder spoken of here it seems to me will not do, however. I admit the powder is costly. When I recommended it and used the manufacturer's name, I received so many letters wanting to know when and where they could obtain the powder, that I felt it best to give the name, thus saving a lot of correspondence.

Dr. Christoph mentioned one thing which you may not have noted; that is the operation in connection with chronic suppuration, a conservative operation. I do not see how you can get any results from the powder if there is any suppuration emptying into the antrum. The powder will dry it up for a while then it will come back, and that is an indication to do a simple mastoid operation. There is no use in keeping up the powder treatment if you do not get results soon. If you can cure them every time they come to you, of course that is all right, but you will not heal a fistulizing type of mastoiditis, so far as our own experience goes. I think if we all narrowed down to this particular treatment and talked about it, we will see something come of it. The hearing tests is one of the indications that you are getting somewhere. Many times the hearing is affected by secretions, and if you make your tests frequently you will see what results you are obtaining.

Dr. George Woodruff, Joliet: I wonder if you have noted the therapeutic effect in x-ray pictures of the mastoid. I am convinced in some cases of running ears, not many, possibly running a couple of months, with no signs of any active mastoid disease, where there is considerable thickening of the mucosa which you can see through the perforation, that the taking of x-ray pictures has had a marked effect on clearing that ear up in a few days, when it showed no signs of doing so before. I was interested at the American Medical Association meeting to see the x-ray pictures shown by a doctor from New York. He has made his own pictures. He stressed the point that he had noted a therapeutic effect from ordinary x-ray pictures. He makes a mastoid picture right away on each side, then if there is a favorable reaction, two or three days later he gives the treatment, and repeats it. If he does not get a favorable result by the first picture, he probably does not repeat. I am quite convinced that I have seen definite improvement in some cases after x-rays have been taken.

Dr. J. A. Oliver, Charleston: I understand that the essayist begins his nasal treatment by using 1% cocaine in 1:2000 adrenalin and follows that with ephedrin in oil as a spray. I believe it has been proved that oil inhibits the action of the cilia and I have discontinued its use. I have been using ephedrin in normal salt solution instead and believe I get far better results.

Dr. Carl H. Christoph, Chicago (in closing): I am very glad that this paper brought out so much discussion. I discussed the matter with Dr. Cavanaugh some months ago and he said he wanted something short and practical and that is what I endeavored to present. I agree with Dr. Stevenson that we should not set an arbitrary time when an operation should be done. As I mentioned before some ears stop discharging after two or three months and some are chronic after the first two or three weeks.

I never considered having the powder made because the amount used is so small that it did not seem worth while.

In answer to Dr. Middleton that inflation is dangerous I would say that we have used inflation not only in chronic but in acute suppurative ears for twenty-five years and I have never seen any serious consequences.

I am sure that there is something in Dr. Woodruff's theory. Professor Neumann of Vienna recommended x-ray treatments for those cases which continued to discharge after simple mastoidectomy and I have found them very useful in my cases.

We use a 0.5% ephedrin with a 0.5% phenol in liquid petrolatum. This is instilled into the nasopharynx with a curved syringe and allowed to run out of the nose. We use a 0.5% ephedrin because it burns less than a 1% and in my opinion the albolene is better than water as a vehicle.

Dr. Beck's discussions are always helpful and I agree with his remarks on the modified radical. As far as peroxide is concerned I have never seen any bad results from the use of it and its power as a mechanical cleansing agent cannot be denied.

## APPENDICITIS IS AN EMERGENCY

GOLDER LEWIS McWHORTER, M. D.

Associate Professor of Surgery, Rush Medical College of the University of Chicago

CHICAGO

It has been shown that the appendix had ruptured in one-third of all cases of acute appendicitis coming to one typical general hospital twenty-four hours after the onset and forty-eight hours from the onset rupture had occurred in one-half of them with the development of serious complications (Taylor and Schmidt<sup>1</sup>).

Rupture was more common in those under ten and over forty years of age.

Acute appendicitis occurred most frequently between the ages of ten and twenty years, and nearly 80% of all cases occurred between the ages of ten and forty. It has been found to occur nearly one-third more frequently in the male than in the female.

Symptoms of appendicitis vary from the mild to the severe and they may become chronic. This increases the difficulty of diagnosis and may confuse the patient into a belief that he has nothing serious.

Contrary to popular belief that acute appendicitis is always associated with severe pain beginning in the right side, the usual onset of

symptoms begins with distress over the upper or the entire abdomen. Sometimes the pain is entirely on the left side even with perforation in a pelvic appendix.

The pain may be cramp-like or constant and of almost any grade of severity. Usually a few hours after the onset the pain or soreness localizes in the right side or at least in the lower abdomen. Nausea and vomiting sometimes occur.

When cathartics have been taken by the patient early in the attack abdominal distress from their action may confuse the patient and later the physician in the diagnosis of appendicitis, resulting in dangerous delay.

The pain usually becomes worse until gangrene or rupture occurs when there may be some temporary relief. This may be termed the crucial period because there may still be time to avoid spreading peritonitis or abscess by immediate operation, although the patient may believe he is getting better, because the pain is not so severe. Prompt and skillful surgery followed by efficient hospital treatment are necessary at this stage of appendicitis.

It is recognized by physicians that some cases of appendicitis are difficult to diagnose early before rupture and peritonitis occur. This is not likely to occur if the physician is permitted to make frequent examinations and is not informed that he will be called the next day if the patient is worse.

Taylor and Schmidt found that in 26.3% of all patients with acute appendicitis rupture had occurred before entrance. They found the incidence of rupture had increased over a four year period from 11.5% to 33.3% with a proportionate increase in mortality. Among those who entered before rupture of the appendix occurred only one out of a hundred died. Schullinger<sup>2</sup> reported a mortality of 0.59% in acute appendicitis before and a mortality of 8.6% after peritonitis had occurred.

The taking of cathartics in an attack of appendicitis increases the frequency of rupture and peritonitis. In a survey of patients entering the hospitals of Philadelphia during a three year period Bower<sup>3</sup> found that over two-thirds gave a history of taking cathartics before going to the hospital. Of those who had taken cathartics of any kind one in sixteen died, while among those who did not take cathartics only one in 109 failed to recover. Of those who received one

Presented over the radio, March 24, 1936, under the auspices of the Illinois State Medical Society.



laxative, one in eighteen died, while of those who received more than one laxative, one in ten died. One should never take a cathartic where there is the slightest possibility of appendicitis. An operation carries almost no risk when compared to the danger of taking a cathartic in acute appendicitis.

There are a number of factors which physicians consider in determining the course of treatment of complications from appendicitis. The chief ones are abscess and peritonitis resulting from rupture of the appendix. In recent years there have been many helpful additions to the hospital management of these serious complications.

In spite of many scientific advances and improved surgical knowledge and skill, there has been a constantly increasing death rate from ruptured appendicitis. Over a twenty year period following 1911 the number of deaths in children under five years from a ruptured appendix increased over 100%.<sup>4</sup> The deaths in all males increased 20% and in females 14%.

Records since 1911 indicate that the increased number of deaths from appendicitis is due to an actual increase in the incidence of the condition in recent years (Seifert<sup>5</sup>). Many are treated with home remedies and the physician is not called until complications develop. The treatment of appendicitis after perforation or with extensive inflammation necessitates the use of the greatest amount of experienced judgment and medical skill. Delay in early operation prolongs the hospital stay and the return to normal activity.

There is one point on which all physicians agree, and that is operation in appendicitis before rupture and complications can occur. If this ideal is to be accomplished it will necessitate operation as soon as the diagnostic symptoms of acute appendicitis develop.

There are many other conditions, some of them also requiring immediate operation, which always must be considered in the differential diagnosis. The judgment and experience of the physician is the only safeguard of the patient in determining the advisability of delay in hospitalization and operation.

It is important that the patient or his parents understand the tremendous risk of rupture of the appendix by only a few hours' delay in operation, after the onset of symptoms which frequently are not associated with a great deal

of pain or disability. It is not unusual to see a patient walk into the hospital with a ruptured appendix.

The treatment of appendicitis after complications have developed must be determined by the physician. No general rule can be made since every case presents a somewhat different problem. Operation may not be indicated in certain types of local and general peritonitis. However, the condition is always a serious one, and one must be prepared for an emergency operation.

In suspected appendicitis repeated visits by the physician are necessary during the first twenty-four hours and, where it is possible, removal of the patient to the hospital to observe the development of further symptoms.

Usually the diagnosis of appendicitis can be made by the experienced physician. Operation should then be performed without delay before rupture or other dangerous complications can occur.

Mild attacks of appendicitis sometime occur which cannot be recognized at first. Although appendicitis is most commonly observed in a young person, every "stomach" complaint at any age should be viewed with suspicion. In children confusion with abdominal distress due to improper eating is a common cause for delay in diagnosis.

After one attack of appendicitis there is always the imminent danger of a more severe recurring attack. Frequently with mild attacks the inflammation and symptoms become chronic and then the diagnosis may be more difficult.

If the appendix is not removed following rupture or due to some other complication, it should be removed within two or three months or as soon as feasible.

Why, do you ask, are there over 18,000<sup>4</sup> largely avoidable deaths each year from acute appendicitis in the United States? It is due to delay in diagnosis, attempted self-medication by cathartics, late hospitalization, and operation after rupture has occurred. Complications are chiefly due to the patient's desire to "wait until tomorrow," to call for home remedies before calling the physician and to postpone going to the hospital.

There is a minimum risk in early operation by the experienced physician in well-organized hospitals. There is grave danger in delay.

Appendicitis is an emergency!  
1526 W. 103 Street.

#### REFERENCES

1. Taylor, A. C., and Schmidt, E. R.: Acute Appendicitis. *Trans. of the Western Surgical Assn.*, 1933, p. 249.
2. Schullinger, R. N.: Acute Appendicitis and Associated Lesions. *Arch. Surg.*, 32: 65, 1936.
3. Bower, J. O.: Acute Appendicitis in Philadelphia. *J. A. M. A.*, 102: 813, 1934.
4. Eighteen Thousand Deaths from Appendicitis. Why? *Statistical Bulletin, Metropolitan Life Insurance Company*, 11: 1, 1930.
5. Seiferl: *Deutsche Ztschr. f. Chirurgie*, Berlin, 244: 176, 1934.

#### BACKACHE

Pain in the back may be referred from distant organs or be the result of diseased or misplaced contiguous organs. Both must be differentiated from backache arising from disease of the vertebral column itself.

In backache due to disease or displacement of distant organs, the pain is usually localized (when the pathologic condition is in the aorta, heart or lungs) in the upper portion of the spine, between or above the scapulae. Stomach, gall-bladder, etc. conditions give rise to pain in the dorsal region; a retroverted uterus or a bladder condition may cause a lower-lumbar pain.

Diseases of the mediastinum and inflammations of the pleura may cause upper dorsal and cervical pain. In the lower portion of the spine, kidney, pancreatic, prostatic and seminal vesicle disease can be factors.—Dr. P. Kruescher, in *Bull. Amer. Hosp., Chicago*, Nov., 1932.

### Society Proceedings

#### COOK COUNTY

##### CHICAGO MEDICAL SOCIETY

*Regular Meeting, Wednesday, January 6, 1937*

#### PROGRAM

Compound Comminuted Fractures of Both Bones of the Leg Treated With and Without Antiseptics, Chester Zeiss and John J. Reynolds.

Discussion, Harry Mock.

Fractures of the Neck of the Femur—A New Method of Treatment, Carlo S. Scuderi and James J. Callahan.

Discussion, Paul B. Magnuson and E. W. Ryerson.

Fractures of the Femur—Per Trochanteric, Shaft and Condyles, William R. Cubbins.

Discussion, George G. Davis.

*Wednesday, January 20, 1937*

#### PROGRAM

Scarlet Fever Prevention, Clarence A. Earle.

Discussion, Arthur H. Parmelee and Archibald Hoynes.

Constriction Ring Dystocia, Louis Rudolph.

The Treatment of Simple Sprains, E. H. Ochsner.

#### HANCOCK COUNTY

The Hancock County Medical Society met in annual session at Carthage Hotel, Tuesday evening, January 5, 1937, at 6:30.

Dr. E. P. Coleman of Canton, Ill., District Councilor of the 4th district, gave a very interesting talk on Medical Economics. He was accompanied by Mr. Russell Reeder, one of his office staff, also of Canton.

After the dinner election of officers resulted as follows:

President, Roland A. Slater; vice-president, M. V. Prescott; secretary-treasurer, W. P. Frazier; censors, E. L. Kingsbury and Blair Kelly; delegate to state medical society, W. L. Irwin; alternate to state medical society, W. P. Frazier; directors, Dale F. Scott, five years; Roland A. Slater, four years; W. P. Frazier, three years; E. L. Kingsbury, two years; W. L. Irwin, one year.

W. P. FRAZIER, *Secretary*.

#### Personals

Dr. Harry Gradle has been appointed consulting ophthalmologist to the Indian Medical Service, U. S. Department of Interior.

Dr. Theodore Cornbleet, among others, addressed the Chicago Pathological Society, January 11, on "The Rôle of Calcium in Scleroderma."

Dr. Walter Schiller, University of Vienna, discussed gynecologic endocrinology before the Springfield Medical Club, January 19.

At a meeting of the West Side Branch, December 17, Drs. Eugene T. McEnery and Paul H. Holinger spoke on bronchiectasis in children.

Dr. Francis D. Murphy, Milwaukee, addressed the Englewood Branch of the Chicago Medical Society, January 5, on "Management of Cardiovascular Renal Diseases."

Dr. Charles J. Drueck, Chicago, addressed the McLean County Medical Society in Bloomington, January 12, on "What Brings the Anorectal Patient to the Doctor."

On January 27, 1937, at Taylorville, Dr. Earl O. Latimer of Chicago addressed the Christian County Medical Society members on "Abdominal Pain from a Surgical Standpoint."

On January 19, 1937, Dr. Ralph A. Reis gave a gynecological clinic for the Sioux Valley Medical Society, Sioux City, Iowa, and delivered an address on "The Third Stage of Labor."

The North Shore Branch devoted its meeting, January 5, to case reports by the staff of Swedish Covenant Hospital: Drs. Ralph A. Davis, Ray-



mond F. Elmer, Oscar T. Roberg, Eric Oldberg and Willard Van Hazel.

Dr. Henry F. Helmholz, Rochester, Minn., discussed "Mandelic Acid in the Treatment of Urinary Infection in Childhood" before the North Side Branch, January 7, and Dr. Charles W. Mayo, Rochester, "Digestive Qualifications of Man."

The German Medical Society of Chicago was addressed December 8 by Drs. William C. Beck on "The Recognition and Management of Peripheral Arterial Disease" and Samuel Perlstein, "The Electrocardiogram as an Aid in Clinical Medicine."

Arnold Emch, Ph.D., has been appointed executive director of the Chicago Hospital Council, succeeding Perry Addleman, who has been appointed to a similar position with the Hospital Service Corporation.

At a meeting of the Peoria City Medical Society, Peoria, January 5, Carlos I. Reed, Ph.D., and Dr. Irving E. Steck, Chicago, spoke on "Mineral Metabolism in Arthritis Under Treatment with Vitamin D" and "Clinical Experience in Treating Arthritis with Vitamin D" respectively.

Dr. William DeHollander, Green Bay, Wis., has been placed in charge of the x-ray department of St. John's Hospital, Springfield, succeeding Dr. Lawrence M. Hilt, who has been appointed to a similar position with Butterworth Hospital, Grand Rapids, Mich.

Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., will deliver the Gehrman Lectures for 1936-1937 at the University of Illinois College of Medicine, January 25, 26 and 27. His subjects will be "Health as a Factor in Social Security," "Industrial Hygiene" and "Syphilis."

The Chicago Gynecological Society was addressed, January 15, by Drs. Henry Close Hesselstine on "Experimental and Clinical Therapy of Vulvovaginal Mycosis"; Herbert E. Schmitz, "Mortality and Complications of 3,129 Supracervical Hysteromyomectomies," and Edwin J. DeCosta and Ralph A. Reis, "The Oral Administration of Paraldehyde for Relief of Pain During Labor."

The Chicago Council of Medical Women held a joint meeting with the Medical Women's Club, January 13; the speakers included William S.

Peterson, Ph.D., on "The Patient and the Weather"; Marian Hood, "Amebiasis with Demonstration of Living Parasites," and Dr. Marie L. Connelly, "Changes Occurring in Hodgkin's Disease."

Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, delivered the thirteenth Ludvig Hektoen Lecture of the Frank Billings Foundation before the Institute of Medicine of Chicago, January 22. The subject of his illustrated lecture was "Vaccinia."

Dr. Irving S. Cutter, since 1925 dean of Northwestern University Medical School, Chicago, and since 1934 health editor of the Chicago *Tribune*, has been appointed medical director of the Chicago and North Western Railway. He has also been medical director of Passavant Hospital since 1928. Dr. Cutter will continue to hold his other positions. He graduated from the University of Nebraska College of Medicine, Omaha, and was identified with his alma mater from 1910 to 1925, holding the deanship for the years 1915-1925. Dr. Victor H. Horning has been named assistant to Dr. Cutter in his new position.

Doctor Meyer A. Perlstein has been invited to address the parent teachers association of the Hitch school on January 21st on the "Relation of Health to School Work."

Dr. Max Thorek addressed the Academy of Medicine of Terre Haute, Indiana, on Electrosurgical Obliteration of the Gallbladder on January 8th.

Dr. Daniel L. Sexton, Instructor in the Department of Internal Medicine, St. Louis University, read a paper on "Endocrinology in General Practice" before the Madison County Medical Society at Madison, Illinois, January 8, 1937.

Dr. Ralph B. Bettman gave a paper on "Surgical Treatment of Empyema of the Chest," before the Whiteside County Medical Society, at Sterling, on January 18.

Drs. C. I. Reed and I. E. Steck presented a program on Arthritis before the Peoria Medical Society on January 5th. Dr. Reed spoke on "Mineral Metabolism in Arthritis Under Treatment with Vitamin D" and Dr. Steck on "Clinical Experience in Treating Arthritis with Vitamin D."

At a meeting of the Chicago Society of Allergy, January 18, Dr. Francis L. Foran, among others, discussed "Treatment of Hay Fever with a Modified Pollen Solution."

The Chicago Pediatric Society was addressed, January 19, among others, by Dr. Frederic W. Schlutz on "Treatment of Nephrosis in the Young Child."

Dr. Arthur J. Bedell, Albany, N. Y., addressed the annual meeting of the Chicago Ophthalmological Society, January 18, on "The Ophthalmoscopic Signs of Failing Health."

The Chicago Roentgen Society was addressed, January 14, by Drs. Bernard H. Nichols, Cleveland, on "Significance of Anomalies of the Kidney and Urter," and Jacob Sagel, Gary Ind., "Ewing's Tumor of the Femur."

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### News Notes

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Dr. Philip H. Kreuscher, assistant professor of surgery, Northwestern University Medical School, has been appointed chief surgeon of the Carnegie-Illinois Steel Corporation in the Chicago area. He succeeds Dr. George C. Davis, resigned. Dr. Kreuscher graduated from Northwestern in 1909 and has been teaching there since 1915. He was formerly medical director of the Illinois Industrial Commission and in 1933 was president of the Illinois State Medical Society.

Dr. Milton M. Portis, Chicago, has been appointed a member of the professional committee for medicine in the Illinois State Department of Registration and Education, to fill the vacancy caused by the death of Dr. Gilbert FitzPatrick. Dr. William L. Karcher, Freeport, was appointed to succeed the late Dr. Malcolm L. Harris, Chicago. Dr. Portis, a graduate of Rush Medical College, was formerly clinical professor of medicine at Loyola University School of Medicine. Dr. Karcher graduated from the Medico-Chirurgical College of Philadelphia in 1900. Other members of the committee are Drs. John R. Neal, Springfield, secretary, and Arthur H. Geiger, Chicago. There is still one vacancy on the committee.

The state department of health has added a question box service to its weekly radio broadcast. The department will undertake to answer or discuss over the air questions of general interest concerning preventive medicine that may

be submitted by listeners. Questions may be forwarded direct to the state department of public health at Springfield or to WGN, Chicago.

The Hines Memorial Hospital at Hines has been placed under quarantine for an indefinite period on account of the prevalence of influenza, it was reported December 30. While there is no outbreak among the 1,750 patients in the hospital, the step was taken as a precautionary measure. During the quarantine, visitors will be admitted only in case of emergency.

The Chicago Heart Association held its fifteenth annual meeting at the Congress Hotel, January 14. Dr. Thomas Duckett Jones, instructor in medicine, Harvard University Medical School, Boston, discussed "The Natural History of Rheumatic Fever and Heart Disease with Especial Reference to Etiology and Prognosis."

The General Education Board of the Rockefeller Foundation has given to the University of Chicago \$3,000,000 for the development of the medical school and the improvement of the university generally. Of \$360,000 to be devoted to medicine, \$250,000 continues present grants. The remainder will finance thirty-six beds in Billings Hospital which have already been converted to free beds and ten additional free beds added in the Bobs Roberts Hospital for children through immediate use of the funds. With the increase in beds, 218 of the 518 beds in the various hospitals in the University Clinics will be entirely free. This figure of 218 beds does not include part pay beds or those used as free beds because of special circumstances, although designated as being for paying patients. According to the university, 47.69 per cent of the work done in the clinics in November was free, and this percentage represents the usual average of unpaid service provided. The establishment of the University of Chicago Clinics and medical laboratories, which were formally opened in 1927, was made possible largely through the assistance of the General Education Board.

The Marshall Field & Company Annex Building window now carries an exhibit loaned by Dr. Hull of the American Medical Association. There are two wax models representing "Aseptic Surgery," the other "Anesthesia," with the figures of Lord Lister and William Morton, and a very short history of their accomplishments.



## Deaths

CLARENCE E. AXLINE, Peoria, Ill.; Louisville (Ky.) Medical College, 1881; aged 80; died, Nov. 1, 1936, of arteriosclerosis and myocarditis.

JOHN EDDOWES BEEBE, Chicago; Gross Medical College, Denver, 1895; aged 84; died, Nov. 14, 1936, of coronary thrombosis and arteriosclerosis.

JAMES M. BEVERIDGE, Oregon, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; a Fellow, A. M. A.; past president of the Ogle County Medical Society; chairman of the county exemption board during the World War; aged 68; died, Nov. 21, 1936.

WILLIAM H. BOHART, Vero Beach, Fla.; Rush Medical College, Chicago, 1891; formerly a practitioner in Chicago; at one time assistant clinical professor of surgery, Loyola University School of Medicine, Chicago; formerly on the staffs of St. Bernard's and Englewood hospitals, Chicago; for many years chief surgeon to the Chicago and Eastern Illinois Railroad Company; aged 67; died, Nov. 14, 1936.

JAMES B. BRYANT, Lawrenceville, Ill.; Louisville (Ky.) Medical College, 1889; formerly a master in chancery for Lawrence County circuit court; aged 76; died, Nov. 21, 1936, of bronchopneumonia and bulbar paralysis.

WILLIAM WESLEY COOK, Chicago; Physio-Medical Institute, Cincinnati, 1882; aged 77; died, Dec. 28, 1936, of influenza and lobar pneumonia.

WALTER LOUIS FINN, Iuka, Ill.; Missouri Medical College, St. Louis, 1899; member of the Illinois State Medical Society; state senator; served during the World War; aged 61; died suddenly, Nov. 7, 1936, of angina pectoris.

CHARLES EDUARD MAX FISCHER, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; formerly associate professor of medical biology, histology and embryology at his alma mater; aged 55; died, Nov. 16, 1936.

LOUIS G. HARNEY, East St. Louis, Ill.; Northwestern University Medical School, Chicago, 1903; member of the Illinois State Medical Society; served during the World War; member of the staff of St. Mary's Hospital; aged 57; died, Nov. 16, 1936, of heart disease.

HUGH OWEN JONES, Chicago; Northwestern University Medical School, Chicago, 1902; member of the Illinois State medical Society; assistant to the president and chief of the medical service, city health department, and formerly assistant and acting health commissioner, and chief of the division of child hygiene; aged 61; died, Dec. 24 1936, of broncho-pneumonia.

JAMES FRANCIS LAWSON, Chicago; Howard University College of Medicine, Washington, D. C., 1907; served during the World War; member of the city

board of health; aged 51; died, Nov. 3, 1936, in the Veterans Administration Facility, Hines, Ill., of hypertension and valvular heart disease.

WILLIS A. MANSFIELD, Washington, Ill.; Chicago Medical College, 1884; aged 78; died suddenly, Oct. 30, 1936, of heart disease.

ARTHUR G. MESERVE, Robinson, Ill.; Miami Medical College, Cincinnati, 1874; member of the Illinois State Medical Society; past president of the Crawford County Medical Society; for many years a member of the school board and board of health; aged 82; died, Nov. 14, 1936, of cerebral hemorrhage and chronic myocarditis.

CHARLES HIMES METZEL, Sidney, Ill.; University of Illinois College of Medicine, Chicago, 1931; member of the Illinois State Medical Society; on the staff of the Mercy Hospital, Urbana; aged 31; died, Nov. 20, 1936.

ALBERT GEORGE PAINE, Chicago; University of the City of New York Medical Department, 1877; aged 88; died, Dec. 3, 1936, in Pasadena, Calif., of bacillary dysentery.

HUGH JAMES POLKEY, Chicago; Rush Medical College, Chicago, 1903; a Fellow, A. M. A.; assistant clinical professor of surgery (genitourinary) at his alma mater; member of the American Urological Association; on the staff of the Presbyterian Hospital; aged 59; died, Nov. 14, 1936, of arteriosclerosis and coronary thrombosis.

SAMUEL BREESE SMITH, Chicago; Dartmouth Medical School, Hanover, N. H., 1893; aged 73; died, Oct. 8, 1936, of cerebral hemorrhage.

JOSEPH P. SMITH, Chicago; Rush Medical College, Chicago, 1888; a Fellow, A. M. A.; clinical professor of medicine, Loyola University school of Medicine; on the staffs of St. Bernard's Hospital and the West Side Hospital; aged 74; died, Dec. 15, 1936, of coronary thrombosis.

JOSEPH C. SPRINGER, Chicago; College of Physicians and Surgeons of Chicago, 1896; for many years coroner's physician and formerly criminologist to Chicago and Cook County; aged 69; died, Nov. 3, 1936, of uremia and chronic nephritis.

GEORGE W. TORREY, Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; also a dentist; aged 65; died, Dec. 12, 1936, of coronary thrombosis.

JOHN A. TUTHILL, Le Roy, Ill.; State University of Iowa College of Medicine, Iowa City, 1881; formerly mayor and member of the school board; aged 81; died, Oct. 7, 1936, of angina pectoris.

WALTER JAMES WILLIAMS, Edwardsville, Ill.; Meharry Medical College, Nashville, Tenn., 1918; aged 44; died, November 17, 1936, in St. Elizabeth Hospital, Granite City, of self inflicted wounds.

JAMES S. MATHESON WYLIE, Chicago; Harvey Medical College, Chicago, 1895; aged 70; died, Dec. 10, 1936, of coronary thrombosis.



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## BUYERS INDEX

### ABDOMINAL SUPPORTERS

Storm, Katherine L., M. D., 1701 Diamond St., Philadelphia, Pa. ....

### FOODS

Coca-Cola Co., Atlanta, Ga. .... 29  
 Corn Products Refining Co., New York City. .... 4  
 R. B. Davis Co., Hoboken, N. J. ....  
 H. J. Heinz, Pittsburgh .....  
 Knox Gelatine Laboratories, Johnstown, N. Y. .... 16  
 Mead Johnson & Co., Evansville, Ind. .... 19  
 Nutritious, Inc., Beverly Hills, Cal. .... 26  
 Ralston Purina Co., St. Louis, Mo. .... 13  
 S. M. A. Corporation, Cleveland. .... 2  
 The Wander Company, 180 N. Michigan Ave., Chicago. .... 12

### FINANCIAL AND INSURANCE

Medical Protective Co., Fort Wayne, Ind. .... 8  
 Physicians Casualty Co., Omaha, Neb. .... 31

### HOSPITALS

Stokes Hospital, Louisville, Ky. .... 27

### PHARMACEUTICALS

American Can Co., 230 Park Ave., New York City. .... 3  
 Armour & Co., Chicago. .... 6  
 Bovine Company, Chicago. .... 20  
 Bristol-Myers Co., New York. ....  
 Carnrick, G. W., Co., 411 Canal St., New York City. .... 17  
 Ciba Company, Cedar and Washington St., New York City. 30  
 Denver Chemical Co. .... 24  
 Gold Pharmacal Co., New York City. .... 31  
 Harrower Laboratory ..... 33  
 Hoffman-LaRoche, Inc., Nutley, N. J. .... 7  
 Hynson, Westcott & Dunning, Charles and Chase Sts., Baltimore ..... 11  
 Lilly, Eli & Co., Indianapolis, Ind. .... 18  
 Merck & Co., Rahway, N. J. .... 14  
 Wm. S. Merrell Co., Cincinnati. ....  
 Morris, Phillip, & Co., 19 Fifth Ave., New York. .... 8

Numotizine, 900 N. Franklin St., Chicago. .... 22  
 Parke, Davis & Co., Detroit, Mich. .... 5  
 Petrolagar Laboratories, 8134 McCormick Blvd., Chicago. . .  
 Rare Chemicals, Nepera Park, N. Y. .... 9  
 Reed & Carnrick, Jersey City, N. J. ....  
 Schering & Glatz, Inc., New York City. .... 15  
 G. D. Searle & Co., 4737 Ravenswood Ave., Chicago. ....  
 Sharp & Dohme, 41 John St., New York City. .... 17  
 E. R. Squibb & Sons, New York. .... 35  
 Frederick Stearns & Co. .... 23  
 Tilden Company, New Lebanon, N. Y. .... 27  
 U. S. Standard Products Co., Woodworth, Wis. .... 26  
 Wm. R. Warner & Co., 113 W. 18th St., New York City. . 10  
 Winthrop Chemical Co., 170 Varick St., New York City. . .

### SANATORIA AND SANITARIA

Edward Sanatorium, Naperville, Ill. .... 27  
 Elmlawn (Wilgas) Sanatorium, Rockford, Ill. .... 25  
 Kenilworth Sanatorium, Kenilworth, Ill. .... 25  
 Michell Farm Sanatorium, Peoria, Ill. .... 36  
 Milwaukee Sanatorium, Wauwatosa, Wis. .... Front Cover  
 Norbury Sanatorium, Jacksonville, Ill. .... 25  
 North Shore Health Resort, Winnetka, Ill. .... 36  
 Rogers Memorial Sanatorium, Oconomowoc, Wis. .... 36  
 Waukesha Springs Sanatorium, Waukesha, Wis. .... 25  
 Weirick's Sanatorium, Elgin, Ill. .... 27

### RADIUM

Physicians Radium Assn., 55 E. Washington St., Chicago. . 31  
 Radium and Radon Corp., 25 E. Washington St., Chicago. . 33

### SCHOOLS

Pogue School, Wheaton, Ill. .... 27

### SURGERY INSTRUCTION

A. V. Partipilo, M. D., 1950 S. Ogden Ave. .... 26

### SURGICAL SUPPLIES

W. A. Baum Co., New York. .... 29  
 General Electric X-ray Corp., 2012 Jackson Blvd., Chicago. . .  
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\*Oelgoetz, A. W., Oelgoetz, P. A. and Wittekind, J., Am. J. of Dig. Dis. & Nutr., Vol. 3, p. 549, Oct. 1936.

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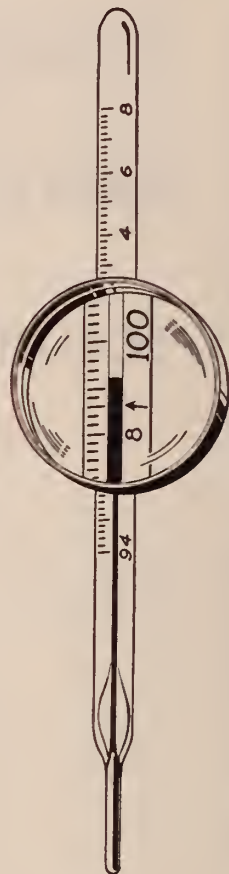


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## Book Reviews

**SKIN DISEASES IN CHILDREN.** By George M. MacKee, M. D., and Anthony C. Cipollaro, M. D. With 153 illustrations. New York-London. 1936. Paul B. Hoeber, Inc. Price \$5.50.

This book is intended mostly for practitioners of general medicine, and is essentially practical, pathological descriptions are omitted; also disputed points, remedies of doubtful value, etc. Eruption characteristics are given in detail, and differentiation is made when diagnosis is difficult. Etiological factors, both internal and external, are emphasized, especially in relation to treatment. Special attention is given to methods of treatment that are suitable for the family physician.

**MODERN TREATMENT AND FORMULARY.** By Edward A. Mullen, M. D. Forward by Horatio C. Wood, Jr., Philadelphia. F. A. Davis Company. 1936. Price, \$5.00.

The busy practitioner will find in this book information for use in his daily office and bedside practice. The major portion of the book is devoted to the essentials of the treatment combined with over two thousand selected prescriptions. This section is arranged alphabetically by diseased conditions, each prescription bearing a number together with a close reference index, making it a simple matter to refer quickly to other related sections.

**MEDICAL CLINICS OF NORTH AMERICA.** Issued serially, one number every other month. Volume 20, Number 2. St. Louis Number—September, 1936. Octavo of 350 pages with 24 illustrations. Per Clinic year July 1936 to May 1937. Paper, \$12.00; Cloth, \$16.00 net. Philadelphia and London. W. B. Saunders Company. 1936.

**BRIGHT'S DISEASE AND ARTERIAL HYPERTENSION.** By Willard J. Stone, B. Sc., M. D., F.A.C.P., Clinical Professor of Medicine, School of Medicine, University of Southern California, Los Angeles; Attending Physician to the Pasadena Hospital, Pasadena, Calif. 352 pages with 31 illustrations. Philadelphia and London. W. B. Saunders Company. 1936. Cloth, \$5.00 net.

In this work the author has placed before physicians a summary in a concise form the many factors that enter into the problem of diagnosis, care, and treatment of the great army of men and women afflicted with Bright's disease and arterial hypertension.

**HEART DISEASE.** By Paul Dudley White, M. D. Second Edition completely rewritten and reset. New York. The Macmillan Company. 1937. Price \$7.50.

This book has been shortened and its bulk reduced by abridgement in part one which deals with methods of examination, and second by reduction in the bibliography.

Two new appendices have been added, the first giving chronologically the historical development of the knowl-

edge of anatomy, physiology, pathology and medical aspects of the heart and circulation and the second giving current classification of cardiac diagnosis approved by the American Heart Association.

**AN INTRODUCTION TO COMPARATIVE BIOCHEMISTRY.** By Ernest Baldwin, Ph.D. with a forward by Prof. Sir Frederick Gowland Hopkins. New York. The Macmillan Company. 1937. Price \$1.50.

**CARCINOMA OF THE FEMALE GENITAL ORGANS.** By M. C. Malinowsky and E. Quater. Translated from the Russian by A. S. Schwartzmana, M. D., Boston. Bruce Humphries, Inc., 1936, Price \$5.00.

This is a very timely work. Hitherto there has been no work fully illuminating carcinoma of the female sexual sphere. In this work the whole subject is brought up-to-date in a very concise and readable work.

**PHYSICAL DIAGNOSIS.** By Ralph H. Major, M. D., Professor of Medicine in the University of Kansas. 457 pages with 427 illustrations. Philadelphia and London. W. B. Saunders Company, 1937. Cloth, \$5.00 net.

This work is a summary of the authors experience covering a period of fifteen years in teaching physical diagnosis to medical students. The author admits having drawn freely both in subject and material from many sources, but the majority of illustrations were taken from patients seen in the University of Kansas School of Medicine.

### INTERNAL HERNIA FOLLOWING ROUND LIGAMENT SUSPENSION

M. A. Michael, Philadelphia (*Journal A. M. A.*, Oct. 17, 1936), states that many cases of internal hernia through the broad ligament, either postoperatively after the Webster-Baldy type of suspension or through fenestration, have been reported. Only three other cases of internal hernia following a round ligament suspension of the Gilliam type have been found reported in the literature, although the occurrence seems such a likely one. Two cases of internal hernia following ventral round ligament suspension were seen in the service of Dr. Block. As a method of prevention when this type of suspension is done, it is the routine in Dr. Block's service that the space between the distal portion of the round ligament and the abdominal wall be obliterated by suturing these two structures together.

Pitressin in abdominal roentgenography is a valuable and effective means of eliminating gas shadows. Pitressin was used by the authors in cholecystography, retrograde and orthograde pyelography and fluoroscopy with excellent results. Jutras & Cantero, *Bull. Assoc. Med. Lang. Franc.* 2:168 (April) 1936.

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### CARCINOMA OF RECTUM: SOME CAUSES FOR POOR PROGNOSIS

A careful analysis of the answers obtained from 200 patients has led J. Arnold Barga and Eugene T. Leddy, Rochester, Minn. (*Journal A. M. A.*, April 6, 1935), to conclude that the poor prognosis of carcinoma of the rectum is the result of: 1. The frequent wasting of valuable time on the part of patients by self diagnosis and self treatment, and by regarding the symptoms as unimportant. 2. Delay by the physician to make a digital examination of the rectum. 3. Lack of knowledge, on the part of the patient, concerning the safety and satisfactory end results of rectal surgery. Symptoms of carcinoma of the rectum simulate those of other be- strongly condemned, for they will place many patients beyond all hope of cure and relegate them to palliation and hopelessness. If doubt exists about any given lesion or group of symptoms, the lesion should be considered carcinoma until it is proved otherwise. The fallacy that rectal symptoms should be considered and treated as functional upsets is perpetuated unfortunately by the exploiters of nostrums, and the physician is forced to compete with those who offer free medical advice for pecuniary reasons only. The patient, who lacks discriminating sense, therefore treats his symptoms but not the underlying lesion until he becomes convinced, by his own failure to relieve himself, that medical advice is highly desirable. As carcinoma of the rectum can nearly always be diagnosed with the index finger, it is lamentable that so many patients who are afflicted with this condition do not consult a physician until it is too late to secure the greatest benefit.

### GANGRENE AND DEATH FOLLOWING ERGO- TAMINE TARTRATE (GYNERGEN) THERAPY

S. E. Gould, Alvin E. Price and Harold I. Ginsberg, Eloise, Mich. (*Journal A. M. A.*, May 9, 1936), report the case of a middle-aged woman who developed gangrene of both lower extremities immediately after the institution of ergotamine tartrate (gynergen) therapy. On postmortem examination all the arterioles examined were found to be contracted. The experimental work of McGrath on rats, demonstrating the production of gangrene following the injection of gynergen, suggests the possibility of a similar effect. The vascular disease present would seem to have predisposed to the development of the gangrene. On the basis of the evidence at hand it is suggested that the use of drugs of this type be avoided in cases of vascular disease such as atherosclerosis, Buerger's disease, coronary sclerosis, and syphilitic narrowing of the mouths of the coronary arteries.

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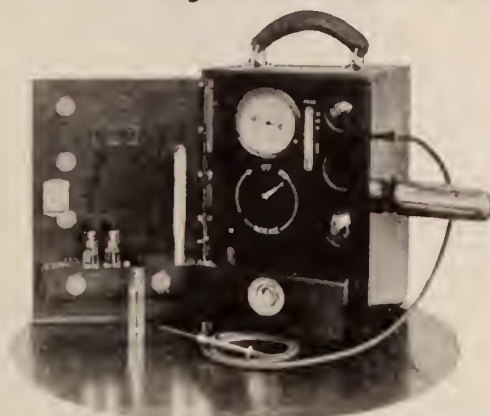
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pupil contracted but intraocular pressure was unchanged. Pitressin has been used with good results in certain cases of human glaucoma. Holtz & Jancke, *Arch. Exp. Pharm.* 181:494 (June 12) 1936.

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(Continued on page 34)



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### HOW FATAL ARE SPIDER BITES?

Two deaths have been attributed to spider bites in Illinois during the last six years, according to Illinois Health Messenger. One occurred in 1932 and the other in 1936. During those six years "the bite of a poisonous insect" was specified, vaguely enough, as the principal cause of 11 other deaths. No deaths were attributed to snake bites during the six years.

An examination of the death certificates fails to produce convincing evidence that the bite of an insect was definitely known to have been entirely or even primarily responsible for death in any of the 13 fatalities attributed to this cause during the six years. The evidence as revealed on the 13 death certificates indicates that an infection took place at the point where an insect may have bitten the victims. This suggests the possibility, even the probability, of an infection due to scratching or exposure of the broken skin to infective matter.

The death of a sixty-seven year old woman at Centuria, for example, was attributed to a spider bite. It was stated on the death certificate, however, that the hand was infected.

In any event the risk of death from the bite of poisonous insects is almost negligible in Illinois. A total of 13 deaths among nearly 8,000,000 people in six years is insignificant compared with the risk of motor car accidents, for instance.

The bite of Black Widow spiders may cause distressful illness for a day or so but the outcome is rarely fatal. Relief can be had rather quickly through proper treatment. A physician should be consulted promptly in all such cases.

### ACUTE HEMATOGENOUS OSTEOMYELITIS: ANALYSIS OF SEVENTY-FIVE CASES

Robert Crawford Robertson, Chattanooga, Tenn. (*Journal A. M. A.*, Oct. 10, 1936), states that in children under 2 years of age the clinical course of the disease varies widely from that of adults. The Ameri-

can Negro appears to be relatively immune to the disease in this section. Acute hematogenous osteomyelitis must be considered when pyrexia and localized pain on bone pressure coexist in the absence of an obvious cause. The majority of the best results were obtained by drainage of the bone within one week following the onset. The mortality rate was also highest in cases in which drainage was instituted within this period. The pathologic changes present, while usually directly proportionate to the duration of the symptoms, are influenced by many other factors. Acute, pyogenic, suppurative arthritis should be considered to be osteomyelitis of an adjacent bone until proved otherwise. Clinically, joints are more resistant to infection than bone and apparently possess marked bactericidal properties.

### HIDDEN TAXES

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## CONTENTS:

Editorials (For Titles See Extended Table of Contents) .....	185	Calcinosis Cutis with Heterotopic Bone Formation. <i>Jerome G. Funder, M. D., Chicago</i> .....	219
ORIGINAL ARTICLES			
Hip Fracture re Roger Anderson Technic. <i>H. D. Junkin, M. D., Paris, Ill.</i> .....	199	Rectal Fistula, Horseshoe Type. <i>M. H. Stracher, M. D., Chicago</i> .....	224
Fracture Neck of Femur re Steel Pin Fixation. <i>Harold A. Sofield, M. D., Chicago</i> .....	200	Skin Manifestations of Drug Intoxications. <i>Wm. J. Marginson, M. D., Springfield, Ill.</i> .....	226
Fracture Neck of Femur re Whitman Spica Cast. <i>Hugh E. Cooper, M. D., Peoria, Ill.</i> .....	204	Scopolamine and Atropine Cycloplegia. <i>Louis Rothman, M. D., Chicago</i> .....	229
Natural Conception Control, Failures and Causes. <i>Leo J. Latz, M. D., and E. Reiner, M. D., Chicago</i> .....	210	Angina Pectoris and Coronary Disease Review. <i>Robert S. Berghoff, M. D., Chicago</i> .....	234
Disappearance of Bacteria from Eyelids and Conjunctiva. <i>G. Howard Gowen, M. D., Springfield, Ill.</i> .....	216	Ophthalmoscopic Signs of Failing Health. <i>Arthur J. Bedell, M. D., Albany, N. Y.</i> .....	238
		Treatment of Arthritis with Massive Doses of Vitamin D. <i>Irving E. Steck, M. D., Chicago</i> ...	243

(Continued on page 8)

Eighty-Seventh Annual Meeting, at Peoria, May 18, 19, 20, 1937

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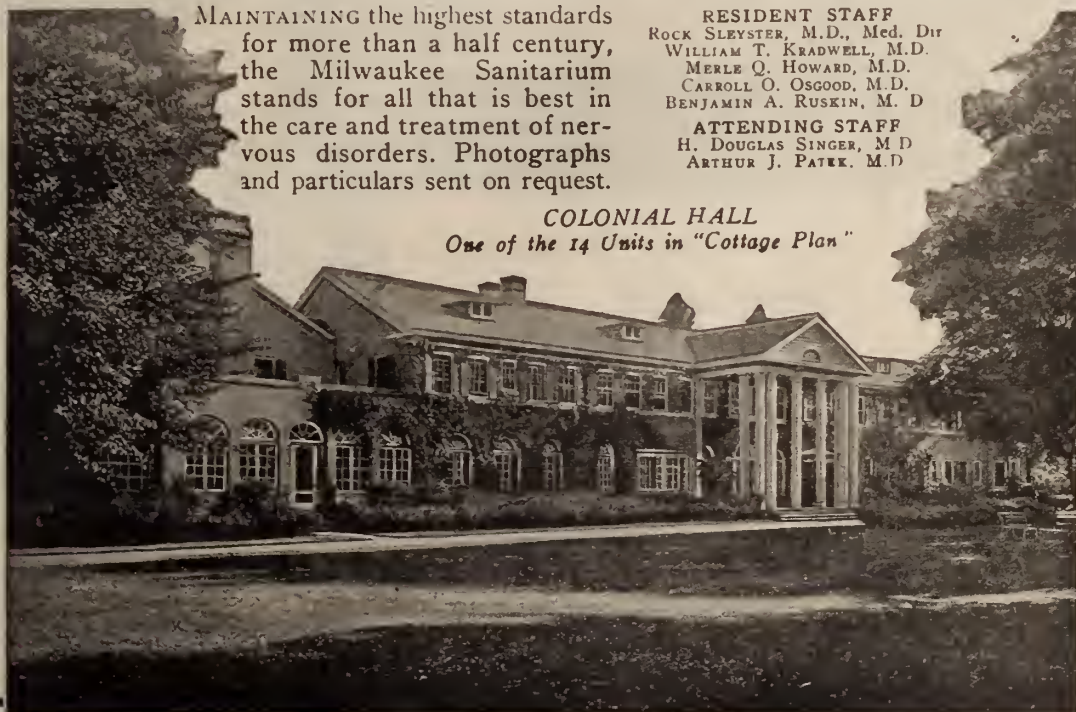
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# VITAMIN REQUIREMENTS OF MAN

## I. VITAMIN C.

• Vitamin C is known to play an important role in human nutrition. Severe deficiency of this factor results in scurvy. It has been estimated by the Committee on Nutritional Problems of the American Public Health Association (1934) that the minimum daily intake of vitamin C (cevitamic acid) required to protect against scurvy increases from approximately 100 International units (5 mg. cevitamic acid) for the infant to 300 International units (15 mg. cevitamic acid) for the adult (1).

Vitamin C intake of this order of magnitude prevents the development of clinical scurvy, however, it is probably inadequate for optimum nutrition. Clear cut cases of scurvy seldom are seen in this country although some authorities believe that symptoms of a mild deficiency of vitamin C are not uncommon (2).

Referring to nutritional deficiency diseases in general it has been said that, "Almost every tissue in the body may be affected by a deficiency in a food factor" (3).

The tissues generally recognized as affected by deficiency of vitamin C are the endothelium of the blood vessels and the teeth. It has been suggested that to prevent the development of subclinical symptoms, a daily intake of 380 to 540 International units of vitamin C is required for a 130 pound adult (4).

Thus it would appear that the optimum in-

take of vitamin C is at least twice the amount required to protect against scurvy.

Data recently published demonstrate that the vitamin C content of human milk is dependent upon the vitamin C content of the maternal diet (5).

Hence when the diet of the lactating mother is low in vitamin C, this factor is also deficient in the milk.

The League of Nations Technical Commission recommends an intake of over 500 International units per day during pregnancy and lactation (6).

The inclusion in the diet of liberal quantities of fruits and vegetables, prepared in such a manner as to retain a major portion of the original vitamin C content, may be relied upon to supply the need for this vitamin. The value of commercially canned foods as anti-scorbutics has been repeatedly demonstrated during the past decade (7).

More recently, the vitamin C content of many commercially canned fruits and vegetables has been determined and the results expressed in International units (8).

Consideration of two factors, namely, the quantitative requirement of the human for vitamin C, and the vitamin C potencies of commercially canned fruits and vegetables, emphasizes the value of these protective foods as sources of vitamin C.

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(1) 1934-35. Am. Pub. Health Assn. Year Book. Page 71

(2) 1933. Chemistry of Food and Nutrition. H. C. Sherman. 4th Ed. Page 421 MacMillan, New York

(3) 1936. J. Am. Med. Assn. 106, 261

(4) 1934. Nature 134, 569

(5) 1936. J. Nutrition 11, 599

(6) 1936. League of Nations Report on Physiological Bases of Nutrition, League of Nations Publication Department, Geneva.

(7) a. 1925. Ind. Eng. Chem. 17, 69  
b. 1928. Ibid. 20, 202  
c. 1933. Ibid. 25, 682

(8) a. 1935. J. Nutrition 9, 667  
b. 1936. Ibid. 11, 383  
c. 1936. Ibid. 12, 405

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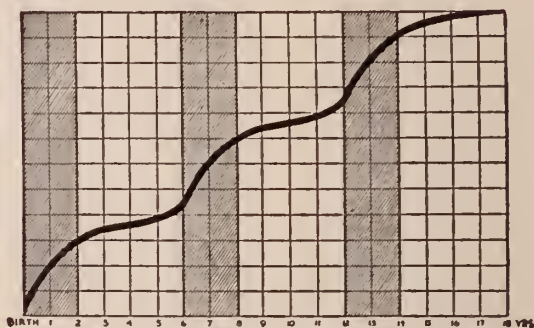
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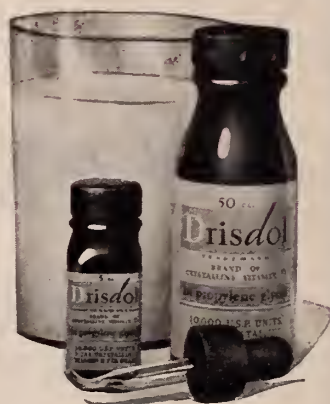
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## CONTENTS—Continued

### ORIGINAL ARTICLES

Prostatitis and Vesiculitis re Treatment with Local Heat. W. H. Kenner, Chicago.....	248
Repercussion Therapy. E. G. C. Williams, M. D., Don- ville, Ill. ....	257
Sepsis of Cryptogenic Origin. Frederick Steun, M. D., and Walter Zeiter, M. D., Chicago.....	261
Dividends of the Depression. A. R. E. Wyant, M. D., Chicago .....	262
Pain and Mental Pain in Workmen's Compensation Cases. Kurt Garve, M. D., Los Angeles, Calif.....	264
Present Status of Immunization Against Contagious Dis- eases. Lee Frech, M. D., Decatur, Ill.....	267

### EDITORIALS

Dental Profession Awakening .....	185
Good Pharmacy .....	186
Doctor vs. Health Service.....	187
Communitistic Law Making .....	188
1937 Annual Meeting .....	188
National Cancer Campaign .....	189
State Medicine Does the Well .....	190
Carbon Tetrachloride Hazard .....	190
Postgraduate Courses .....	191
Medical Economics. Dr. E. S. Hamilton.....	192
President's Address. Dr. J. S. Templeton.....	193
Educational Committee .....	196
Woman's Auxiliary .....	197
Fever Conference .....	198
Joslin Report .....	198

### CORRESPONDENCE

Benefit Tickets. Edna S. Newman.....	198
--------------------------------------	-----

### SOCIETY PROCEEDINGS

Cook County-Chicago Medical Society.....	272
Pike County .....	273
Marriages .....	273
Personals .....	273
News Items .....	274
Deaths .....	275

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\*Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245

Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154

N. Y. State Jour. Med., June 1935, Vol. 35, No. 11

Arch. Otolaryngology, Mar. 1936, Vol. 23, No. 3, 306-309

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No. 11, 590; Laryngoscope 1935 XLV,  
149-154. Proc. Soc. Exp. Biol. and Med.,  
1934, 32, 241-245.

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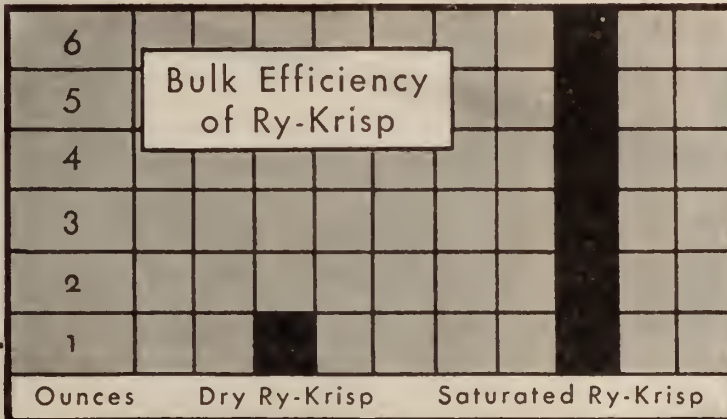
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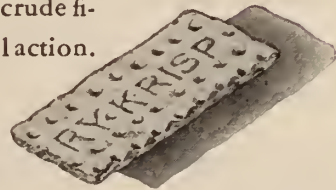


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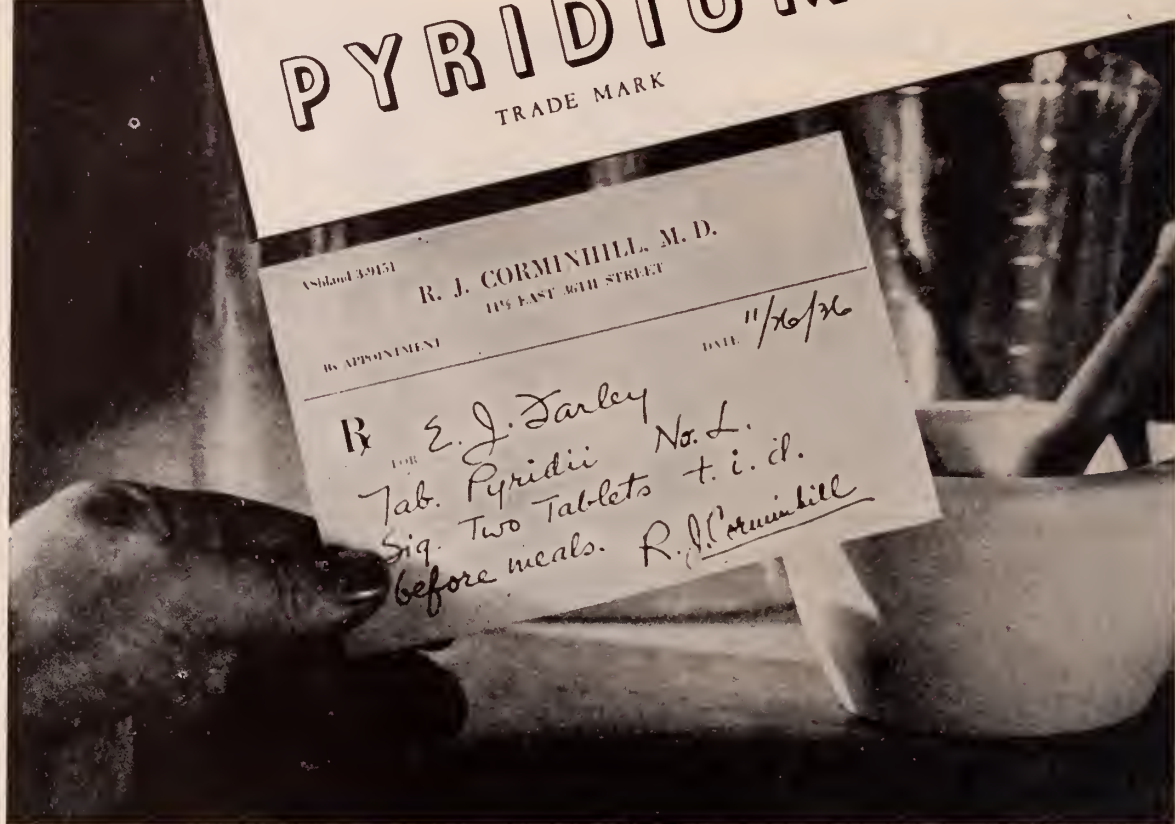
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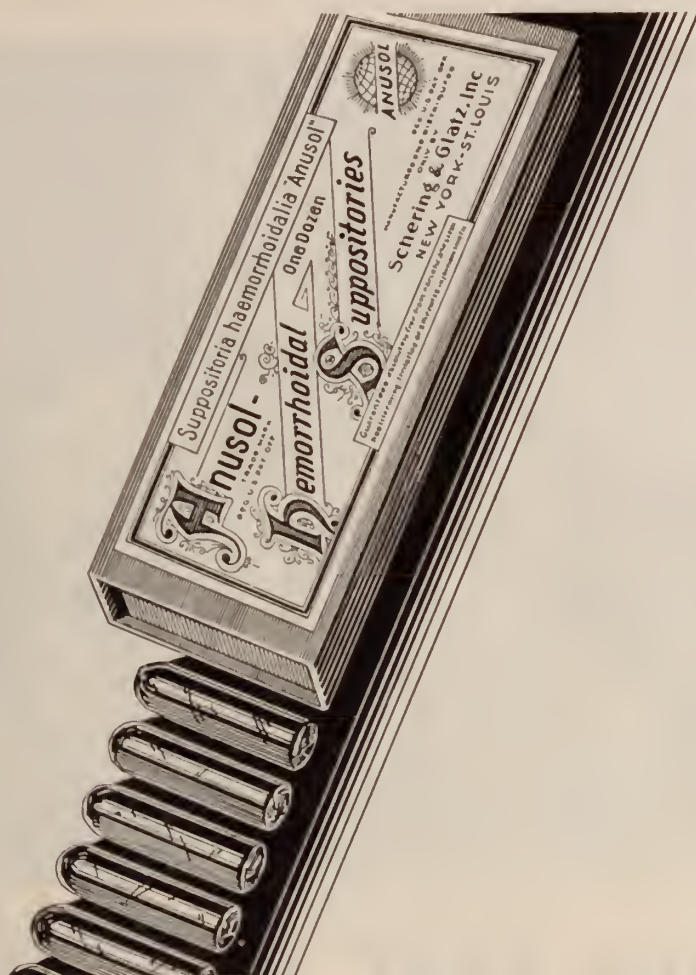


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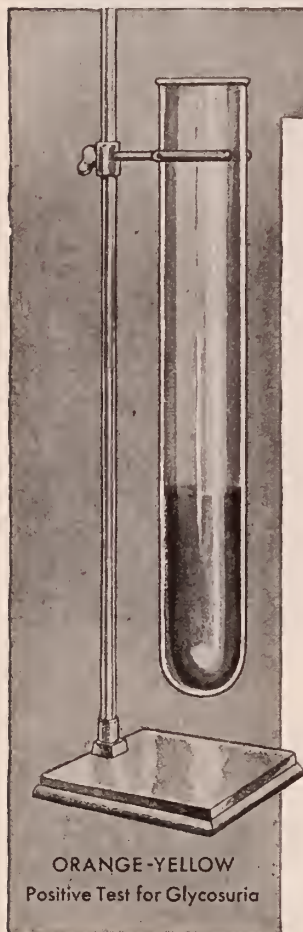
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# ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF  
THE ILLINOIS STATE MEDICAL SOCIETY

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## Editorials

### DENTAL PROFESSION AWAKENING TO MENACE OF STATE MEDICINE AS SET FORTH BY DOCTORS

That the medical profession has not merely been crying "Wolf, Wolf" in its crusade against state medicine and compulsory health insurance is being realized by the dental profession. To such an extent in fact that many of its members are taking up their pens to fight the false propaganda of the socialistic doctrines now sending their mephitic vapors through the air.

Recently in "Medical Times" appeared an article "The Fallacy of Health Insurance" by Floyd G. Rea, D. D. S., Brooklyn, N. Y., from which is quoted the citations below. Dr. Rea, in protest against inflicting the Bismarckian experiment upon America comments also that, "This experiment would not be so bad if Germany's effort had been successful. On the contrary, that effort has proven a dismal failure, and would be instantly overthrown if it were possible, which is not the case, either on the part of the Government or of the poor people; for many of the poor unfortunates have been paying premiums into this fraudulent mess all their lives when they might have been saving, and they are now aged paupers depending upon the starvation pittance called old age insurance which is the only thing standing between them and complete destitution."

And further

"In Germany the workman pays a premium of between 20 per cent. and 30 per cent. of his wages and payments start at the age of 14 years; therefore if he pays for the next 45 years and earns only \$5.00 weekly, the total sum with interest would amount to \$7,000. If he makes \$17.50 weekly the amount would be \$25,000. What does he receive in return? Mediocre or factory-production medicine of an indifferent character, unemployment wages of a starvation dole character, and the average old age annuity of \$7.00 per month for him, \$4.50 per month for his widow, and \$2.50 for his orphans.



"Where does the money go, you ask? Into that bottomless pit called lay administrators, bureaus, and the construction and maintenance of gigantic and costly lay administration buildings which have become inured to graft.

"The social insurance scheme in Germany has had the effect of keeping down wages and tending to make practically all of the working population pauperized proletarians. It has also had the effect of producing vicious frauds which have been deceptive and wasteful of the funds through evasions, and workers have to be set to watch workers, while supervising physicians are set to spy on physicians.

"From the standpoint of economics this egregiously wasteful governmental fiasco in Germany has been one of constantly rising costs. In 1913 the budget for social insurance was 1,300,000,000 marks; in 1930 it rose to 6,000,000,000 which did not include expenses of public welfare which were 4,800,000,000 marks more. On the other hand, since sickness insurance has been in effect the average number of days of incapacity from ill health has risen from 5½ to 28 days although health in general has been greatly improved.

"This latter factor of sickness insurance would be a natural sequence because the border line between illness and health, between indisposition and illness, and between hypochondriacs and fakers is one which the physician cannot readily diagnose, if at all. The entire question of malingering has become so complicated that a limitation has been placed on medicines, and physicians can no longer prescribe what they think the patient needs but only those cheap remedies listed in a book of medical regulations for insurance purposes. The meaning is that the genuine patient suffers lack of care and the lay bureaucratic apparatus inserts itself between physician and patient."

#### GOOD PHARMACY IS MEDICINE'S COOPERATING HAND-MAID

There can be no permanent peace, nor deep amity between physician and pharmacist, until the pharmacist shrives himself of his sins against the medical profession. No matter what contragrief the pharmacist or dispensing chemist may have against the physician, nothing is so reprehensible as the pernicious, prevalent and often illegal practice of "counter-prescribing" so freely

indulged in in such a multitude of drug stores. The average pharmacist is suffering from much of the same affliction as now makes the "over-trained" nurse, anathema in the eyes of practical physicians. Standardized pharmaceuticals have been placed conveniently to the physicians' hands. Such is the worth and merit of so many of them that it is easy to understand why pharmacists and drug clerks fall into the error of "counter-prescribing." "*Facilis descensus Averni.*" And the best "rx" against condoning an error is not to make it. "Counter-prescribing" has been with us since the days when the lad who had picked primroses as carelessly as bounteously sneaked into the back door of the drugstore for a furtive dose of copaiba or methylene blue rather than face the family doctor.

The Narcotic Act has brought up a keen cause of dissension based largely on that fact that in some instances rather than to lose a sale or to go to the inconvenience of contacting the prescribing physician when it comes to the refill of prescriptions with narcotic content, either the cock-sure druggist leaves out the narcotic altogether or so reduces its amount that it can be sold as "Exempt."

Substitutions of therapeutics that the pharmacist "*thinks*" contain "*almost*" the same ingredients as that asked for by the physician are much commoner than realized.

And, sorry the statement though none the less true, is the sadder sin of substituting cheaper or more convenient ingredients than those called for in the prescription.

Well has it been said that "Inattention to incompatibilities—frequently the cause of explosions while being compounded—has long been a bone of contention."

The richest, perhaps most justifiable counter-attack of the chemist, is as old as Hippocrates. Ancient tablets bear witness. This is of course that the physician does not know how to write legibly, or will not do so, merely for the sake of making the druggist work harder. Added to this is the indubitable fact that an illegibly written prescription is often carried around by the patient for some time prior to delivery to the pharmacy,—which of course does nothing at all to help matters.

Telephones have made contact with physicians such an easy matter that the pharmacist might well make such contact his personal message to

Garcia. If the doctor has used abbreviations that are too brief for precision,—let alone safety; if he has written out a compound for potent or poisonous drugs, in blurry pencil, or blotted ink, or undecipherable chirography, the conscientious pharmacist does by the physician what the physician did not do for him—he contacts and checks up.

Pharmacy is medicine's hand-maid. Without good pharmacy medicine sings a sorry tale. Instead of contention between the two there should be consultation and resultant confidence and co-operation.

### THROWING OUT THE DOCTOR IN FAVOR OF THE PHYSICAL EDUCATOR IS POOR SCHOOL HEALTH SERVICE

Another rabid instance of the tail wagging the dog comes to sight in the tendency to permit the so-called "physical educators" of the school systems to take precedence over members of the medical profession in the direction and, indeed, in the very *absolutism* of what is what in the matter of supervision of the health of school children.

Too much emphasis cannot be placed upon the need for medical decision to be held superior to physical direction. Physical activity when well planned is a splendid unit in the development of the child. But the program must be cut to fit the individual child rather than that the individual child shall be cut to fit the program. Nutrition, rest and other contributory factors may often mean more to a child's physical well-being than any amount of exercise. As to a child's capacity to meet the requirements of the physical director no one is qualified to pass except a regular, practicing physician and to make such a member of the medical profession secondary to lay athletes partakes of the nature of legalized mayhem.

Dangerous physical conditions are often obscure. Only a licensed medical man, and sometimes not he, can discover these conditions which may be aggravated by the lay prescribed physical program for a normal, healthy child. Physical educators throughout the national educational system are endeavoring now to discard the doctor or at the most to make him their subordinate. It is well for doctor and dentist to realize that

the value and the future of school health service is about to be removed from their jurisdiction. In this connection it may be well to quote from a recent article in the "*School Physicians Bulletin*." In part this article said:

"A State Civil Service examination was held recently for the position of a Director of the Division of Health and Physical Education in a State Department. Several physicians and physical educators took the examination. Among the physicians were two of national reputation for their years of success in the work. Among the physical educators was a young man who last year received his Ph. D. from a well known institution. The examination was conducted by a professor of physical education in the institution from which the physical educator received his Ph. D. and in whose classes he took his work.

"In the Foreword of his Thesis on which he was given his Ph. D., he gave his former teacher as his *Sponsor*.

"The ratings reported on the examinations were as follows:

"1—Physical Educator

"2—Physician

"3—Physician

"4—Physician

"The appointing power rejected No. 2 because of his age, though a leader for many years in school medical inspection, physical education and health education.

"No. 3 was rejected because she was a woman. This candidate presented far less qualifications than did Nos. 2 and 4.

"No. 4, though outstanding in the field for his achievements, was demoted in rank, which prevented his appointment.

"It was well known before the ratings were announced that numbers two and three would not be appointed for the reasons above given.

"It was necessary to appoint one of the first three, two of whom were eliminated by the appointing power in advance of the ratings.

"This left the former student of the conductor of the examination the only available candidate.

"Was it fair or unfair for his former teacher and sponsor to rate his qualifications above those of No. 4 and to set up a list with two known eliminations, that a physical educator might be appointed?"



## THE SUN NEVER RESTS UPON COMMUNISTIC LAW MAKING FOR AMERICAN RIGHTS BREAKING

The law-making season is at hand again. It behooves the medical profession everywhere to keep an unusually vigilant eye upon the proceedings in state and federal halls of legislation. *Communists never let up.* Remember that one of the worst rods in pickle served up to the medical profession in a long time is the comparatively recent "Epstein Bill" or "Byrne Bill" or "Health Insurance Law" which the State of New York found on its doorstep. Laid there while the doctors slept.

The anonymous fathers of the imposition were, in the main, representatives of "Trust Foundations," "Endowments" and other socialistic boulevardiers making all possible trouble for the laws of human rights and decency and self-respect. One of the brightest points of the scheme was that the levy for this measure would be made on an employer-employee basis, with the starting point salaries or wages of \$3,000 per annum, and the levy on either employer or employee to be so divided that a total of *four and one-half per cent. (4.5%) would come from them*, while from state funds would come one and one-half per cent. or (1.5%). State funds also come from employers and employees.

Even an astigmatic eye can detect the joker there without much trouble. Our old friend "double taxation."

Quoting further comments made in various media as to this neat bludgeon against the rights and privileges of American science and American democracy it is observed that "This law planned to allow disability insurance for the worker up to 26 weeks, to him and all his dependents, regardless of the relationship, free medical, dental, nursing, laboratory, and x-ray services together with free hospitalization, and prenatal and maternity care; the last to include disability insurance for the expectant mother *if she too were employed*. The total collected premiums for this insurance *would amount to 6 per cent. of the employee's salary in every instance*; and since figures were advanced that the average annual income in the state of the group included in the bill was \$1,400, it therefore followed that at 6 per cent. the average sum per insured would be

\$84. From this meager stipend would easily have been taken at least two-thirds for administrative expenses and lay salaries, leaving about \$28 per year for disability benefits for the insured up to 26 weeks, and medical, dental, nursing, pharmaceutical, laboratory, and hospital expenses for him and his entire family and dependents, in which the average family of dependents would certainly have been at least four; at that rate there would have been a per capita allotment of \$7 per person. If this latter sum had been divided equally there would have been the magnificent amount of one dollar for health and sickness disability, one dollar for dental services, one dollar for drugs and sundries, one dollar for nursing, one dollar for laboratory and x-rays, and one dollar for hospitalization per year with nothing left over for prenatal and maternity care."

Again in the Department of Economics *Medical Times*, edited by Thomas A. McGoldrick, M. D., it is stated in further comment upon this and other socialistic legislation that this "Epstein Bill" or "Byrne Bill" provided that "a *Director of Health Insurance* shall be appointed at a salary of \$10,000 per year. Also a Health Insurance Board of three members at \$7,500 per annum; a nice, easy start for soft jobs and treasury raiding which would soon have eaten up the \$84 which the poor, deluded, insured employee contributed, and he would have contributed the whole amount regardless of the apparent division of the premium. First, he contributed his share from his salary; next, the employer added his percentage to his operating expenses so that when the employee purchased goods he would pay the additional cost included in the article; and, last, the state contributed 1.5% from the general tax fund; and since the employee was also a taxpayer he paid his proportion of the burden. From the standpoint of economics the whole scheme was simply a subterfuge for grabbing \$84 from the employee and using it for the purpose of creating a lot of fat sinecures."

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## THE 1937 ANNUAL MEETING

The 1937 Annual Meeting of the Illinois State Medical Society will be held in Peoria on May 18, 19, 20, and from the efforts of the host

Society, the Committee on Arrangements, Section Officers, and the officers of the State Medical Society, it seems quite logical to believe that the 1937 meeting will be one of the largest in attendance in the history of the Society.

Members who expect to attend the annual meeting should arrange at once for suitable hotel accommodations in Peoria, and Dr. W. A. Malcolm, Chairman of the Hotel Committee, will be pleased to make reservations for anyone asking for same. All meetings will be held in the Pere Marquette Hotel, the official hotel for the meeting. All exhibits, technical and scientific, will also be displayed in this building.

The officers of the scientific sections of the State Medical Society are arranging programs for their respective sections which will appeal to all members. The meeting will begin on Tuesday morning, May 18, with special meetings of Pediatricians, Obstetricians and Gynecologists, and the annual conference of secretaries of the county medical societies. Registration for the meeting will begin at 8:00 a. m. Tuesday, and it is necessary that all members and guests register before attending any sessions.

The Peoria Medical Society, acting as official host for the meeting, has been working for months to have everything arranged for a highly successful meeting, and having been host for many previous meetings, this society is anxious to see the largest attendance present this year that has ever assembled for a down-state meeting.

The preliminary program for the meeting will be published in the April ILLINOIS MEDICAL JOURNAL, and the official program will appear in the May *Journal*, giving much information concerning the meeting.

The House of Delegates will have two meetings, one on Tuesday afternoon, May 18, and the second on Thursday morning, May 20. Every county medical society in Illinois is entitled to representation in the House of Delegates, and it is hoped that each society will select a delegate who will attend the meeting and participate in the deliberations at each session.

Complete details and the preliminary program will appear in this *Journal* next month, and every member of the Society should begin now to plan to be present at the 1937 ANNUAL MEETING.

## THE NATIONAL CANCER CAMPAIGN

As the various menaces to man's health and happiness reach a stage where a frontal attack on them is possible a mobilization of our resources against them is inevitable.

Tuberculosis, blindness, maternal health, child welfare, crippled children, The American Red Cross are names or phrases which offer a welcome challenge to public spirited and sympathetic men and women all over the United States.

With the appearance of each new organization comes more need for self-sacrifice and public service. It would require superhuman qualities not to feel a little worry as the number of appeals continues to mount. In spite of this fact, however, mature thought and consideration has shown that in every instance the need is urgent and very real and that the new organization is well qualified to meet it.

The most recent group to mobilize its strength against a great and cruel scourge is the Women's Field Army of the American Society for the Control of Cancer. This nationwide organization of the women of America will conduct a steady and relentless war to save, not to take human life. It is the kind of happy, wholesome fight against fear and ignorance in which everyone can and should willingly take part.

The enemy is a cold and subtle killer which last year took more than 140,000 lives in the United States alone. It has been estimated that there are between three and five hundred thousand sufferers from this disease alive today. Perhaps half of them might be saved if knowledge of the signs and symptoms which might mean early cancer were given to them and if they were also strengthened by courage to act on that information without delay.

To the millions of our people whose relatives and friends have borne the cross of cancer the call to arms will come as a welcome and long awaited summons. There will be a real and lasting satisfaction in enlisting as a soldier in a great fight. Cancer is no respecter of class, race, or creed. To combat it is a common task which will recognize no preference. It is a truly unifying and democratic undertaking which should mean all the more in the midst of a civilization torn with undemocratic claims for selfish rewards.

The fight will last long and will require both courage and patience. It must be a matter of



personal responsibility undertaken willingly in memory of those who have suffered and for the protection of the hundreds of thousands who need no longer do so. No one is so busy that he can afford to neglect his part in the united effort to check the silent inroads of a cruel killer.

When in March the first enlistment campaign is conducted there will be hundreds of thousands who flock eagerly to the symbol of the drawn sword and who will gladly do their part to bring light and peace where the darkness of ignorance and the sorrow of fear now are found.

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### STATE MEDICINE DOSES THE WELL AT THE EXPENSE OF THE SICK

Sickness is often an economic problem rather than pathologic. Sickness insurance is a form of deadly infection which creates a constantly increasing amount of illness and emasculates the individual by depriving him of his courage, sense of responsibility and manhood. He becomes fundamentally a chronic and demoralized invalid.

In England fourteen out of one hundred claimed sickness benefits in 1921 and this grew to twenty-three in 1927. With unmarried women the proportion grew from twelve to twenty-one and for married women from nineteen to thirty-eight out of each hundred applicants.

According to estimates, from 60% to 75% of those who come for medical attention are in no need of it. If told so they are displeased and flock to quacks who must be paid for their services. In only five of nineteen countries having National insurance were the patients satisfied with the service.

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### HAZARD OF CARBON TETRACHLORIDE IN THE REMOVAL OF ADHESIVE TAPE

Dr. Fredmont A. Chandler of Chicago in the *Journal A. M. A.* gives a report of a near fatal case following its use, we quote as follows:

In view of the aroused interest in adhesive solvents since the recent tragic accident in mid-western university training camp in which two lives were lost, there is danger of exchanging fire hazards for less familiar asphyxiative ones. Benzine or similar products are inflammable and must be protected from open flames or sparks. These products are more efficient in the removal

of adhesive tape and of desquamated epithelium. They are well tolerated by young patients. The potential danger of fire is probably only slightly greater than that present in the use of alcohol solutions which are on every dressing tray or cart.

On the other hand, carbon tetrachloride softens desquamating skin only slightly. Its odor is offensive to children who have had recent anesthetics.

Carbon tetrachloride and similar chemicals have definite and dangerous anesthetic properties. A recent issue of *Time* describes the use of carbon tetrachloride as a means of killing foxes so as not to injure their pelts. The vapor is heavy, a feature enhancing its use in a fire extinguisher. Its use by some otolaryngologists in irrigating the external auditory meatus is to be condemned because of the possibility of leakage in the pharynx by way of the eustachian tube.

Dr. Chandler reports the following case to show that the free circulation of air in a large, open ward is not sufficient to eliminate the anesthetic properties of carbon tetrachloride under certain conditions:

C. P., a white girl, aged 4 years, had tuberculous spondylitis of the third and fourth and the seventh and eighth dorsal vertebrae of eighteen months' duration. A spine fusion operation to immobilize the diseased area of the spine was performed without any shocking effect on the patient. Convalescence was highly satisfactory. Solid food was tolerated within twelve hours. The operative dressings, which were held in place by adhesive tape, were changed on the fourth day by the intern. While he was removing the dressings, the child was prone. Carbon tetrachloride, which had been substituted for benzine by the hospital authorities because of the potential fire hazard, was used as a solvent to facilitate the removal of the dressings. The patient collapsed suddenly, respirations ceased and the radial pulse became impalpable. Death appeared imminent. Artificial respiration was instituted. In about five minutes the pulse returned, as did active respiration, at first feebly, and then stronger. In about ten minutes the child was quite normal. The subsequent convalescence has been uneventful. This case is reported as a warning against the indiscriminate use of carbon tetrachloride in the removal of

dressings from the upper part of the body, head and neck.

The presentation of carbon tetrachloride solutions and allied substances as safe solvents for the removal of adhesive tape under certain circumstances must be questioned. The layman is probably more familiar with the dangers of inflammatory mixtures than with those of heavy vapors possessing toxic potentialities.

6 North Michigan Avenue.

### POSTGRADUATE COURSES

The Illinois State Medical Society is vitally interested in the activities going forward under the authority of the Social Security Act. The Act encompasses many fields in which medicine is directly or indirectly concerned and one of these fields is associated with the Maternal and Child Welfare clause. In this section Federal moneys are allotted to the States "to extend and strengthen services for mothers and children in rural areas, in areas suffering from severe economic distress and among groups in special need." Since 1929 rural infant mortality rates have exceeded urban rates—the reverse of prior years. From 1933 to 1934 the rural infant death rate increased from 59 to 62 per 1,000 live births and the urban death rate increased from 57 to 58.

In an effort to improve maternal and child welfare in this State, the Society is cooperating with three other organizations, namely, the State Department of Public Health, Illinois Academy of Pediatrics and the American Committee on Maternal Welfare, Inc., in bringing postgraduate courses in obstetrics and pediatrics to the County Medical Societies. These programs are of a clinical and scientific nature and will embrace a wide variety of problems encountered by physicians in general practice. The speakers are men well qualified in these two fields of medicine.

The general procedure is to offer a series of five or six programs at weekly intervals. The meetings will begin at 4:30 p. m. and a paper on obstetrics and one on pediatrics will be presented. Dinner will follow at 6:30 and in the evening starting at 7:30, two more papers will be given. Ample time will be had for discussion. Clinical work will be offered also in the earlier part of the day when there is a desire for it. On the same day of the following week two different speakers will present entirely different topics.

The manner in which these meetings will be held will, of course, vary with wishes of the individual Society, the general plan being to adopt the proceeding which will be of the most interest to the greatest number.

Dr. Harold H. Hill of the Department of Obstetrics and Gynecology of the University of Illinois is the Field Consultant in this educational work. He will make the appropriate arrangements for the series and in general co-ordinate the activities of the four participating organizations.

Present plans call for programs to begin in March and conclude in May as nothing will be offered in the summer, unless there is special demand by some county or group of counties. They will be resumed in September.

The Society believes the physicians of the State will welcome this opportunity to receive this graduate work in their local communities and hopes that full advantage will be taken of it.

The State Council has given its stamp of approval to this work and has designated the Educational Committee as the medium through which the work in the State is to be co-ordinated. Twenty-four programs have already been scheduled for March, April and May, while next fall and winter the programs will be in full swing.

### TREATMENT OF ORGANIC ARTERIAL OBSTRUCTION BY ALTERNATING SUCTION AND PRESSURE: DEVICE TO RELIEVE INCIDENTAL ARTERIO-SPASM

Edward Al'en Edwards, Boston (*Journal A. M. A.*, Feb. 20, 1937), declares that in cases of both acute and chronic organic arterial obstruction there is apt to be an associated spasm of the collateral vessels. This spasm counteracts the effect of the suction-pressure therapy and is not relieved by the treatment. He describes a device that furnishes warmth to the affected extremity while it is treated by suction-pressure. Such locally applied warmth is capable of maximal vasodilatation and increases the effectiveness of the suction. Moreover, the local increase in metabolism caused by the raised temperature assist in the process of healing.

Eclampsia is accompanied by concentration of the blood. This may be detected by serial determinations of hemoglobin, cell volume, or serum protein. Clinical improvement parallels effective blood dilution. Glucose solution may be used for blood dilution, the amount to be given depending upon the degree of blood concentration. Dieckmann, W. J., *Am. J. Obst. & Gynec.* 32:927, 1936.



## MEDICAL ECONOMICS

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Edited by the Committee on Medical Economics  
of the  
Illinois State Medical Society  
E. S. Hamilton M. D., Chairman  
Kankakee, Illinois

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During the last month the problem of medical care of those farmers, who are clients of the Federal Resettlement Administration has been brought to the attention of organized medicine in Illinois as well as the contiguous states. The number of farmers who are receiving aid from the federal government is not definitely known, but it is much greater than most medical men had believed at least here in Illinois. Unfortunately, definite statistics were not available by the representatives of the Administrations, with whom the conferences were held. According to these representatives, the number in Illinois was around 5,000, distributed through the southern two thirds of the state with only an occasional client in the northern third. Without much question the recent flood in southern Illinois will increase the number of so-called clients. To become a client of the Federal Resettlement Administration, a farmer must have derived his last income from farming and in the opinion of the local representative be capable of the work. Then if he cannot borrow money from any place else, the Resettlement Administration after investigation by a local council will loan him the money to set up farming and in addition will loan him enough money to live the first year. The client will sign notes for the amount of the money borrowed. The representatives of the Administration are endeavoring to make some arrangement whereby their clients can be assured of adequate medical care at a price they feel their clients can afford. Accordingly through their Regional Director, Mr. Hays of Indianapolis and Dr. Williams, Medical Director, on detached duty from the U. S. Public Health Service, they are contacting the state medical societies of the Middle West in an effort to work out some plan for uniformity. At the first meeting with these men, the Chairman of this Committee was present and tried to see the problem from the side of both the medical profession and the government. At a subsequent meeting held in Chicago, February

14, the day the Northwest Regional Conference was in session, representatives of five states met and talked over the problem. The Chairman of this Committee was not present at that meeting. That same evening a special meeting of the Council of the Illinois State Medical Society was held to consider the problem. In addition to the Council, Dr. Woodward, Director of the Bureau of Legal Medicine and Legislation of the AMA; Mr. Hays; Dr. Williams and Mr. Carmichael, State Director for Illinois, were present. After considerable discussion, the problem was referred to a special Committee under the Chairmanship of Dr. John Neal of Springfield to study them and report at the next regular meeting of the Council.

Many interesting questions came up during the discussion. It was admitted by the representatives of the Administration that to the best of their knowledge their clients had been receiving adequate medical care and there had been no discrimination against them by the medical profession on account of their lack of funds to pay the doctors. However, they felt that some scaling of the fee schedule for their clients would result in more income to the doctors, because the administration would insist that the additional money loaned their clients, on account of sickness, being paid to the doctors. The exact method by which this was to be accomplished was under discussion. Aside from the plan in use in the Dakotas and that of Oklahoma, there was no concrete example of the way it might be handled. On account of the large percentage of farmers on relief in the Dakotas, a special plan had been set up there. It was generally admitted by the representatives of the Administration that such a plan would not be advisable in Illinois. The Oklahoma plan would work, but the Administration would prefer another plan, which had some of the features of prepayment insurance. This, of course, was not agreeable to the medical profession.

Another outstanding feature was the lack of

uniformity as to the number of clients in Illinois and their distribution by counties. Each man talked to had a different idea as to which counties contained the most clients and none of them could or would give the exact number in each county. In some counties there was doubt as to the accuracy of some of the figures given by the state Director, Mr. Carmichael.

One left the meeting wondering just how great was the demand for action in this work and somewhat perturbed at the apparent lack of definite information on the part of those representatives of the administration who were present. It is to be hoped that the Committee under Dr. Neal will investigate the accuracy of the figures when and if he receives the same from the officials. The officers of each county society should cooperate with Dr. Neal and see if the so-called clients in his county are actually entitled to relief and if they are, whether some other agency of government has been supplying the relief. Overlapping of relief has occurred in the past and in view of the admission of the Administration that their clients have not been neglected and the opinion of some of the doctors present that the figures stated were high, the possibility of overlapping should receive serious consideration.

The annual meeting of the Northwest Regional Conference was held at the Palmer House in Chicago on Sunday, February 14, 1937. The attendance was good, especially that of the officers of the Illinois State Medical Society and this Committee. The program was excellent and all those who attended came away with a keener realization of the economic problems of the medical profession. It is regrettable that the seriousness of this question has not as yet been realized by the rank and file of the medical profession. And they will be the ones who will be affected most by any changes and will naturally complain the loudest at that time. There is a great demand for speakers to lay audiences on the subject of state medicine and the supply is inadequate. There should be several men in every county society who have prepared themselves on the subject so that they can fill the requests for speakers.

The special article this month is an address of Dr. J. S. Templeton, President of the Southern Illinois Medical Association, delivered November 12, 1936. Careful reading of the same will be both instructive and stimulating.

E. S. HAMILTON, M. D.,  
Chairman.

## PRESIDENT'S ADDRESS

J. S. TEMPLETON, M. D.

PINCKNEYVILLE, ILL.

Ladies and Gentlemen, Members of the Medical Profession:

I want to thank you for the opportunity of directing the affairs of this Association the past year. We have tried a new method, that of having a one day session. This association has met every year excepting one for the last sixty-two and that one was during the world war. Just how much good has been accomplished cannot be estimated. However, we know the organization and its meetings have done worthy service for Southern Illinois and our inhabitants. Some good to others, of course.

I am proud to preside over this meeting in Murphysboro, a city that has an enviable reputation for harmony among the medical profession, for a devoted profession bending their energies to promote scientific medicine, working shoulder to shoulder to relieve the suffering and ills of humanity.

I am proud to belong to the Southern Illinois Medical Association. Within what other confines or territory will you find medical men of the rural districts who with but little effort may attend a meeting every Thursday evening between the months of September and June to study scientific medicine? Such is the privilege of those who belong to the five county organizations of our community.

These five counties are in the heart of Southern Illinois and physicians from other counties are always more than welcome. All that is necessary is to have their names put on our mailing list. We medical men of Southern Illinois are not trying to go alone. Each of the separate counties is proud to be a part of the Illinois State Society, one of the best State Societies in America, a Society that is progressive and much copied by other similar organizations. We have an Educational Committee second to none, a Committee on Medical Economics that ranks with the best, a Legislative and other committees that really deserve special mention.

Not content with these contacts, many of us belong to the American Medical Association, which, no doubt, is the greatest of its kind in the world.

Read before the Southern Illinois Medical Association, Nov. 12, 1936.



You may ask why all of these organizations. What is the objective? This question is easily answered. To learn and practice scientific medicine for the benefit of humanity. Not for our own personal benefit for we are here but for a short time, but scientific medicine will go on and on for countless centuries. Scientific medicine began in a feeble way before the time of Christ. Hippocrates dreamed of better days and the oath written by him and handed down from generation to generation is teachings we may yet emulate. At the time Christ was born into the world, man's conception of scientific medicine was very vague. Nor did he grasp the fundamentals of the Christian religion. Because of his ignorance he tried to combine religion and medicine and they both suffered degradation. Seeing this, governments undertook to take charge and the confusion became greater than ever. What was the result? Days so dark for humanity that history will always record the following centuries as the dark ages. For more than a thousand years scientific medicine hung by a thread. It was in the clutch of ignorance and political control. To us who were born in a more enlightened age, this seems impossible, yet it is true. Witchcraft, superstition and ignorance prevailed to such an extent in the old world that when the colonists settled what is now our United States these things continued and thrived for a time. Among the many plagues that were so baffling to medical men of the 17th, 18th and early part of the 19th centuries, was one with which we older men are all more or less familiar; namely, smallpox, which came into Europe during the tenth century. Because of the slowness of travel and communications, it was five centuries before it spread over the continent. It was no respecter of persons. Louis XV of France died of it, also Queen Mary of England who died in 1694. The Queen was 33 at the time of her death. In the century following her death, sixty million persons in Europe died of smallpox—more than half a million a year.

Shortly before the Mayflower landed in America, smallpox had come up through Mexico and infested the Indians and it is said half of those inhabiting the Eastern Coast of America died within a few years.

Among the colonists, Boston was the most seriously afflicted with smallpox. Eleven thousand or one-half the population were stricken in one year.

Asiatic cholera invaded New York City in 1832 and in eight years there were about 4,500 deaths in the city. In the two decades following there were 9,000 deaths from cholera alone. Before another epidemic struck the city, sanitation and scientific medicine had been so developed it caused but few deaths and little terror.

Yellow fever prevented the French from building a canal across the Isthmus of Panama. So great was the mortality from the disease during their work there that it is said there is a Frenchman buried under every tie of the Panama Railway. General Gorgas applied scientific medical ideas to its sanitation and now it is the healthiest spot in the world.

Jenner's application of science to medical practice gave us vaccination and relieved us of all fear or danger of smallpox. But for ignorance and negligence the world need never have another case of this loathsome disease. Proper sanitation and application of medical science has relieved America of all dangers of cholera.

The mastery of these plagues is a small part of the victories of scientific medicine; what a difference it makes on our way of living in this old world today. Surgery, anesthesia, sanitation, vaccination, and more than a hundred other things are the result of the application of medical science in the hands of the medical profession, none of which have been brought about by government control of medicine.

For more than a century and a half medicine in the United States has been master of its home house. More progress has been made during these years than in any five centuries, or in fact, in all history of mankind. Some of us well remember when we began using antitoxin for diphtheria, how families of afflicted children were cured as if by magic.

Typhoid of today is fast vanishing. Who of you have in the last twenty years heard a paper on how to treat typhoid fever? We so seldom see a case, we know there is little to interest the profession. While we give of our best of scientific medicine in the treatment, we realize it is scientific sanitation and vaccination that prevent others from becoming infected and cut the death rate. A few more years of vaccination against typhoid and proper sanitation, and it, like Asiatic cholera, yellow fever and smallpox, will be eradicated.

The accomplishments of scientific medicine during the last century have been so great that

every man living today who has studied and practiced this science has every reason to be proud. Mankind, especially of North America, should rejoice with us.

The next question is, do they? We answer yes; some of them do. The mother with her sweet, innocent, cooing babe in her arms, or in its crib, thinks of all that might happen to that child. Diphtheria? No. Our family physician will take care of that; he will vaccinate and our loved one will never have it. Smallpox? No. Epidemics of that rage no more, and vaccination will prevent that also.

I could continue naming one thing after another that crosses the mother's mind, and every time she consoles herself that we have a family physician with a kind heart, a keen intellect and a willing disposition to serve, ready at all times to apply his knowledge of scientific medicine. What a consolation. What a relief; and it is shared by every member of the family. It is not the rich, common or poor people that want a change. They want to have their own family physician and pay him.

It is the communist and the politician. The communist seeks a chance to bring his ideas before the common people and he flatters and cajoles the politician, leads him to believe that what he has to offer will please everybody. And it often does please too many. Communism is the embodiment of regimentation, versus individualism. Individualism has been the shining star of all progress in medicine. Hippocrates, working alone and individually, accomplished much. A long line of individuals, Aesculapius, Paré, William Hunter, Oliver Wendell Holmes, Semmelweis, Simpson and many other men known for their individual ideas and character served well this old world. Where would medicine be today if it had not been for the lives and accomplishments of these great individualists? What has regimentation done for us? Study the history of the world and you will find that countries that try to regiment and deprive their citizens of individual rights are soon on the road to destruction. We have the politicians to contend with. Every President we have ever had was a politician. Every representative and senator is a politician. Everyone is to some extent listening to the designing communist who has brought nation after nation to its ruins. There is a wave of communism traveling westward through Europe and it has already made its

presence felt in our beloved United States. Organized medicine may well beware of its future, great as are its achievements of the past. No doubt the Romans of the Golden Age thought that their civilization was stable, yet within a few centuries it passed into the degradation of the Middle Ages. The danger to the scientific spirit, to the advance of medicine and to the integrity of civilization, does not come from the mass of unthinking people. This danger comes from intelligent people who play a part in shaping civilization, but who have not been trained to think rationally. It comes from sentimental and idle people in whom the primitive instinct escapes from repression and rises to prevent thought. We have an example in the life of Napoleon Bonaparte, one of the greatest men of history. He led his people to believe they were fighting for a great cause, that they were offering their lives for their beloved country, when in reality they were dying to satisfy his lust for power, his ambition to rule not only his own country but all the near nations of Europe. Frederick the Great said: "No man has the right to allow himself unlimited sway over his fellow men. Only the tyranny of government brings the people to rebellion."

With these plain, undeniable facts before us, may we not in some way arrest the progress of communistic interference with the practice of medicine? I say progress because we have the first requisites for the regimentation of medicine. The Social Security Act is now law and we have an administration more than willing to put it into effect. I know little of other policies promulgated in the Social Security Act, but I do know that the medical part, if put into effect, will degrade the profession. It will interfere with the progress of scientific medicine. Citizens of the lower walks of life will suffer and medical care will be far more unevenly distributed. A poor man will not be able to pay his taxes and hire a family physician as he does today.

The medical sciences are today giving the world the healthiest period it has ever known, but they are not yet mature. What has already been accomplished in scientific medicine is small in comparison with future possibilities of preventing disease, alleviating suffering and prolonging human life. What shall we do? Sit idly by and shirk our obligation or go on like men and oppose the enactment of laws detrimental to scientific medicine? Do not say there is nothing



we can do. Occasionally I hear some one criticizing our State Medical Society for not doing more. Now is the time each individual can do something; individually take hold. You will have plenty of help. See that your County Medical Society sends a resolution to each of your Representatives in Congress and Senators, as well. Ask them to vote to repeal that part of the Social Security Act that pertains to the practice of medicine. If there must be something in that Act, let them confer with medical men who believe in and practice scientific medicine.

If the medical profession does not know what is best for the care of our sick, and how it should be distributed, our lives are a failure and we should not be allowed to practice medicine.

#### EDUCATIONAL COMMITTEE

*Report for January and February, 1937*

##### SPEAKERS BUREAU

Eighty-three doctors were scheduled to address lay organizations in 12 different counties of the state.

"Extraordinarily interesting and beneficial."

"His excellent talk was received with enthusiasm."

"Fine lecture. Appeals to the audience."

"Excellent. Never had anyone give so much interesting information in so short a time."

"Lecture well given and well received."

Material was furnished to clubs where the attendance did not warrant a speaker. Radio talks given by members of the Illinois State Medical Society are being used as study material by many of these smaller groups.

Women's clubs, men's clubs, parent teacher associations are asking for programs on syphilis. As soon as a large enough list of speakers is available, programs on this subject will be offered high schools in the state.

The Committee finds that the subject of STATE MEDICINE is of interest to lay organizations. Almost every week talks are given on this topic.

Series of programs have been arranged for a fraternity of the Chicago Medical School, one a month for five months.

Chicago Y. M. C. A.s are making considerable use of the Speakers' Bureau and the following have had semi-weekly, weekly or monthly programs:

Lawson Y. M. C. A.

Central Y. M. C. A.

Sears Roebuck Y. M. C. A.

Wilson Avenue Y. M. C. A.

Y. M. C. A. Hotel.

##### RADIO PROGRAMS

37 popular health talks were given over WBBM, WGN, WJJD and WAAF.

It is very difficult to find enough speakers for these radio talks and the Committee does not wish to have to depend on just a few men to give these programs. An attempt is made to have the programs varied by round-table discussions, questions and answers. These radio talks are one thing which we must keep going

for the stations give us the periods free of charge and they depend upon us to see that the speakers are there with something interesting to give the listening public.

#### EXHIBITS

Exhibits of health material have been secured for the Illinois Federation of Women's Clubs (Syphilis), Wilson Avenue Y. M. C. A. (Quackery), Central Y. M. C. A. (Popular Health Questions), the Sangamon County Medical Society (Cancer), and Marshall Field & Co. Annex Building.

The January window at Fields consisted of modeled figures of medical leaders (anesthesia and aseptic surgery) secured from the American Medical Ass'n.

The February window at Fields displayed a beautiful heart model loaned by Mr. Tom Jones of the University of Illinois and heart charts loaned by Dr. Robert S. Berghoff.

#### COOPERATION OTHER ORGANIZATIONS

The Vocational Guidance Panel sponsored by the Chicago Chamber of Commerce, the Chicago Rotary Club and North Park College proved to be a huge success. Dr. Foley, President of the Chicago Medical Society, made the final arrangements for this discussion on opportunities in medicine and the tour of Cook County Hospital which followed. About 60 young men students of North Park College were privileged to participate in this excellent program.

Copies of the booklet outlining the method of procedure for the SUMMER ROUND-UP campaign sponsored by the Illinois Congress of Parents and Teachers were sent to officers of all county medical societies. Contacts were made for the Parent Teacher Officers with a number of medical societies.

Material has been furnished all the Home Bureau Advisers of the State at the request of the Extension Department of the University of Illinois. Suitable material is sent every month.

Study material was supplied the American Red Cross.

The secretary has given cooperation to the Woman's Field Army of the American Society for the Control of Cancer, has met with the Illinois chairman, furnished information, names, and speakers when called upon. The radio talks sponsored by the Committee during the two middle weeks of March will be devoted to the subject of CANCER.

#### SCIENTIFIC SERVICE COMMITTEE

40 scientific programs were secured for 20 county medical societies—two of the programs were for Scott County in Iowa.

#### NEWSPAPER SERVICE

I heart clinic was arranged for La Salle County Medical Society.

Late in January a special article on PNEUMONIA, written in different style from our other material, was sent to 447 newspapers in Illinois. These were papers not using a regular health column from the Illinois State Medical Society. A card was enclosed which editors could return indicating their desire to receive similar articles every week—some for release over the authority of the local county medical society. As a result of this venture

86 editors requested weekly articles and during the month of February they were sent material on *Syphilis*, *Socialized Medicine*, *Whooping Cough*, *Scarlet Fever*.

40 health articles were sent to 20 papers using articles once a month.

704 releases to downstate newspapers.

159 releases to Chicago and vicinity.

1,104 health articles to downstate libraries and home advisers.

384 health articles to Chicago branch libraries.

#### PUBLICITY FOR CHICAGO MEDICAL SOCIETY

34 releases to Chicago papers re Chicago Medical meetings.

81 releases re North Side Branch meeting.

10 releases re Englewood Branch meeting.

8 releases re North Shore Branch meeting.

#### RELEASES TO NEWSPAPERS ABOUT MEDICAL SOCIETY MEETINGS

109 releases for LaSalle County.

103 releases for DeWitt County.

25 releases for Randolph County.

13 releases for Henry County.

55 releases for Bureau County.

48 releases for Whiteside County.

27 releases for Jefferson-Hamilton.

#### SERVICE TO COUNTY MEDICAL SOCIETIES

600 notices prepared for LaSalle County.

176 notices prepared for Henry County.

145 notices prepared for Randolph County.

135 notices prepared for Perry County.

174 notices prepared for Whiteside County.

122 notices prepared for Franklin County.

96 notices prepared for Bureau County.

94 notices prepared for Effingham County.

87 notices prepared for Jefferson-Hamilton County.

#### REFRESHER COURSES IN OBSTETRICS AND PEDIATRICS

Through the office of the Educational Committee contact was made with county medical societies for Doctor Harold K. Hill. The following county societies are planning to sponsor the refresher courses and meetings will be held weekly with programs being given in the late afternoon and evening:

McLean

Sangamon

DeWitt

Logan

Menard

Mason

Fulton

McDonough

A total of 58 speakers have been secured to present the programs for these societies—all of which will be given between March 4th and May 25th.

Publicity has been given the first program in DeWitt-Logan Counties.

Outlines for the speakers, as submitted by Dr. Hill and his Committee, have been mimeographed and mailed. The plan is to furnish outlines to all men attending the courses so that they may have them for notes and reference.

Mimeographed copies of the county programs have been made for the secretaries to use in their publicity.

Respectfully submitted,

JEAN McARTHUR, Secretary.

#### ORGANIZATION ACTIVITIES OF THE WOMAN'S AUXILIARY

In keeping with the promotion of increased membership for the year, the President of the Auxiliary to the Illinois State Medical Society, requested this item be written.

This phase of Auxiliary work is indeed a very interesting one, and while it entails much hard and persuasive endeavor, it is most interesting. There can be no doubt but that education plays the biggest part in the promotion of an Auxiliary, in fact it seems to be the first step. We must thoroughly understand the purposes and aims, become imbued with the idea, and then we may pass this knowledge on to others.

We should eradicate the prevailing idea that an Auxiliary is just another social organization, for it is far from being one. A medical Auxiliary is simply what the word "Auxiliary" implies, a help or aid; in reality it is the Public Relations Committee for the medical society, and as such it has many opportunities to contact the laity, through the many and various clubs and lay organizations to which the doctor's wife belongs.

One must take in consideration when endeavoring to form an Auxiliary the desire on the part of the wives for such an organization. A thorough discussion of every phase of the Auxiliary is advisable, stressing the importance of its various functions, and its field of usefulness. It is well to note that an Auxiliary is found both in large and small communities, and it has been definitely established that where an Auxiliary exists, that that particular Medical Society is wide awake, and we may say a modern one.

As you no doubt know, we must have the consent of the County Medical Society before an Auxiliary may be organized. If the advantages of the Auxiliary are made clear to the physicians, very little objection is voiced against the formation of such an organization. Naturally the medical profession welcomes a helping hand in these days, especially when that help can reach out into the lay world. Not only can information concerning common medical problems be passed on, but the Auxiliary is a help in legislative matters affecting the profession. One proof of an advantage of an organized group of wives of doctors, is that it has been demonstrated as an Auxiliary much may be accomplished, where as an individual, one is simply lost in the swirl.

But one of the greatest advantages of an Auxiliary is to be found in the bringing together of doctor's wives in closer contact with each other, forming new acquaintances, and in many instances cementing lasting friendships.

To belong to an Auxiliary is to me a very happy privilege, in that I am doing my duty in some small



way to further a better understanding of the problems of the modern physician.

Mrs. Herbert B. Henkel,  
Illinois State Organization Chairman.

#### AUXILIARY APPRECIATION

To LaSalle County Woman's Auxiliary we extend a hearty welcome. We feel that our pleasure in having a newly organized unit added to our list is small compared to the pleasure in store for this new group of Auxiliary women in working out the State program. Mrs. Raymond E. Davies, Councilor for the Second District, and members of Bureau County, are to be congratulated. The good efforts of Mrs. H. B. Henkel, Chairman of Organization, were another factor in the success of the undertaking.

The new officers are:

President, Mrs. A. I. Raminofsky, LaSalle, Ill.

Vice-President, Mrs. Geo. Guibor, Ottawa, Ill.

Secretary-Treasurer, Mrs. J. S. Terrando, LaSalle, Ill.

Historian, Mrs. V. Vighi, Ottawa, Ill.

Program & Public Relations, Mrs. J. DeVries, Marseilles, Ill.

Membership, Mrs. E. P. Twohey, Ottawa, Ill., and Mrs. J. W. Geiger, LaSalle, Ill.

Hygeia, Mrs. L. Christian, Ottawa, Ill.

We wish them success and happiness in their new duties.

Mrs. V. M. Seron, Chairman,  
Press and Publicity.

#### INTERNATIONAL CONFERENCE ON FEVER THERAPY

In conjunction with the International Conference on Fever Therapy to be held at the Waldorf-Astoria Hotel on March 29th, 30th, 31, 1937, there will be a scientific and commercial exhibit staged.

The clinics will be held at the College of Physicians and Surgeons, Columbia University, New York City.

A large attendance of fever therapists from all over the world is expected. A very interesting and instructive program has been arranged and all of those who plan to attend the conference are urged to register promptly with the general Secretary, Dr. William Bierman, 471 Park Avenue, New York City. The registration fee is \$15.00.

Anyone desiring information in connection with the Military Surgeons 1937 convention to be held at Los Angeles, October 14 to 16, the American Association of Orthopedic Surgeons to be held at the Biltmore Hotel, Los Angeles, January 15 to 19, the American Association of Railway Surgeons meeting to be held September 21 to 22 at the Palmer House in Chicago, or the International Fever Therapy Conference, as above mentioned, should address Mr. Robert Lewin, 505 N. Michigan Ave., Chicago, Ill.

#### JOSLIN REPORT FAVORS GELATINE FOR MILK MODIFICATION

A study conducted by Dr. C. Loring Joslin, Department of Pediatrics, was made with a group of infants

as they appeared at the clinic of the University of Maryland to determine any essential differences in milk and modified milk. The results are reported in a paper "Some Clinical Observations on Feeding Infants Whole Milk, Gelatinized Milk and Acidified Milk" published in the January, 1937, issue of the Archives of Pediatrics.

The group (150 infants) included not only normal feeding cases, but infants complaining of vomiting, constipation and other disorders relating to the digestive system. Any practicing physician would be confronted with similar cases.

All the infants received approximately the same amount of food including cod liver oil and orange juice. Fifty of them were fed ordinary cow's milk fifty acidified milk (three drops of lactic acid to one ounce of milk), and fifty infants received the gelatinized milk. One or two per cent. gelatine was added to the latter formula by first softening the gelatine in the water of formula which had been boiled and cooled. The gelatine was softened ten minutes before added to the milk of the formula.

The results of the study showed:

1. Infants fed gelatinized milk were less susceptible to infections, especially upper respiratory infections, than those fed acidified or cow's milk.
2. The occurrence of diarrhea was less frequent in the acidified milk group and the gelatinized milk group, than in the unaltered milk group.
3. The group of infants fed gelatinized milk had a better rate of gain than those fed acidified milk or plain cow's milk.
4. Vomiting and "appetite poor" symptoms among the infants were cured or showed improvement when fed gelatinized milk which contrasts remarkably to the feeding results of the other groups which showed little change.
5. The infants in the gelatinized milk group had more favorable results than the acidified milk group or cow's milk in relation to constipation.

#### Correspondence

Chicago, Ill., Feb. 22, 1937.

#### IN NO WAY CONNECTED WITH BENEFIT TICKET SALE

*To the Editor:* The Illinois State Nurses Association wishes to announce to the public that it is in no way connected with a benefit ticket sale conducted each spring for needy, sick or destitute nurses, nor do we know of any nurses receiving such aid.

The Illinois State Nurses Association has been incorporated in this state for 36 years. It represents 99½ per cent of the nursing schools of this state. It is the only official nurses association in Illinois recognized by the United States government.

Cordially yours,  
Edna S. Newman, President  
First District, Illinois  
State Nurses Association

## Original Articles

### HIP FRACTURE TREATMENT BY THE ROGER ANDERSON TECHNIC

H. D. JUNKIN, M. D.,

PARIS, ILL.

Hip fracture has presented a major problem from the earliest periods of medical history. Kellogg Speed<sup>1</sup> terms the so-called intracapsular femoral fracture "The unsolved fracture." All of us agree that any advance in the care of these problems is not only welcome but indeed timely.

The literature is very rich in papers on hip fracture. From the application of the simple Buck's extension, the use of nails, pins and intricate internal fixation splintage with the autogenous bone peg as described by Albee;<sup>2</sup> each has found enthusiastic supporters. Perhaps the abduction method of Whitman established the basis for the advancement made in recent years. The fact remains that since so many methods have been suggested, it reflects the feeling of dissatisfaction by the profession in the results obtained in solving this problem. Certainly, many of us in the field of general surgery have not been entirely content with our results in hip fracture. The definite improvement in our service after adopting the Roger Anderson technique prompted this presentation.

A short description of the detail of the technique of applying this dressing will be given. You are referred to Roger Anderson's publication in the October issue of the American Journal of Surgery, 1933 for more detail.<sup>3</sup> Briefly, the patient is given either one-eighth or one-sixth of a grain of morphine with 1/200 grain of hyoscine before going to surgery. A  $\frac{1}{16}$ " Stineman pin is passed through the lower end of the tibia of fractured hip. Of course, strictest asepsis is practiced. A sterile sponge is now placed against the extremity on each side of the pin; the pin tranfixing the sponge near the center. Novocaine 1% in the soft tissues at site of insertion of the pin is all that is required in way of anesthesia. Stockinette is then applied from tip of toes to mid-thigh on both lower extremities. A light covering of sheet wadding is then applied and a felt pad over the plantar surfaces

of both feet and well over the heels. Plaster is then applied, first to the well leg and then the injured extremity from tip of toes to mid-thigh. A window is cut over both patellae, the head of the fibulae and over the extensor surface of both feet. The splint is now attached first to the well leg cast and then to the pin of the injured extremity by means of a few turns of plaster bandage. After this has set, extension, internal or external rotation is effected by adjustment of the splint and reduction easily accomplished. We have modified the original technique in that the felt pad used over the plantar surface of the foot is extended over the heel and as high on the leg as the level of the malleoli. The malleoli are protected with felt so that no opening in the cast is cut over them. Both extremities are encased in plaster casts from toes to mid-thigh and after final reduction is obtained, a plaster bridge is built between the casts thus immobilizing the extremities firmly and assuring maintenance of extension even though the extension nut should be released after the patient returned home. Recently, at the suggestion of Roger Anderson,<sup>4</sup> we placed a Stineman pin through the upper end of the tibia of the well leg, incorporating it in the cast thereby taking most of the pressure off the plantar surfaces of the foot. This has added much to the comfort of the patient. The cast was extended to the toes as before as this support to the feet is desirable.

This report is based on one hundred (100) cases in which the Roger Anderson Well-Leg Splint was used. Thirty-eight were hip fractures and are the cases under discussion. The age of the patients ranged from 40 to 96. For clearness of description and with a desire to avoid confusion in classification, we shall divide our cases into fractures of the neck referring to the high fractures of the neck, and fractures of the trochanteric area. Fifteen of our cases were fractures of the neck and 23 involved the trochanteric area. All living past a year recovered with bony union and good function. Six deaths occurred or about 13%. Three deaths were due to pneumonia and all were females. One, aged 74, died two months after reduction; one, aged 87, died three weeks after reduction; and the third, 95 years, died during her second week following reduction. Two died of cerebral hemorrhage. Both were males. Each fell to the

<sup>1</sup>Read before Section on Surgery, Illinois State Medical Society, 86th Annual Meeting, Springfield, May 19, 1936.



floor resulting in a fracture of the hip. One male, aged 79 years, died the second day. The other, a male, aged 92, died 36 hours after the injury. The sixth case, also a male, aged 63, died on his 36th day after injury. This case I will comment on more in detail later.

Most of our cases left the hospital at the end of a week. The casts were removed after twelve weeks. The trochanteric fractures were permitted to put some weight on the injured extremity on removal of the dressing. At the end of six months, full weight bearing was permitted. In the neck fractures, full weight was not permitted for one year. In one of our cases, Mr. E. P., aged 63, who sustained a fracture of the trochanteric area in an automobile accident, an opportunity to examine the fractured area at the 36th post-reduction day was made possible at a post-mortem. The autopsy was conducted a year later by an insurance company in order to attempt to settle their liability. The fracture showed complete healing with perfect alignment of the fragments. This opportunity of observing the healing process suggested at once the possibility of shortening the morbidity of these cases; at least those involving the trochanteric area.

#### SUMMARY

1. Thirty-eight cases of fresh hip fracture are reported with six deaths. The cases which recovered all had bony union and excellent function.

2. The Anderson Well-Leg Splint affords a satisfactory procedure to effect and maintain reduction of hip fractures with the minimum discomfort and trauma to the patient.

3. The recovery of these patients certainly is favored by the fact that local anesthesia is adequate; immediate use of the wheel chair permits freedom of movement and change of position; the tranquility of home surroundings by the short period of hospitalization; and the use of physio-therapy which is so applicable with this set-up.

4. Mechanically, skeletal traction, abduction, and internal or external rotation is easily accomplished with this splint. And lastly, the technique is simple and practical for the average surgeon.

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3. Roger Anderson: The Well-Leg Counter Traction Method. The Amer. J. of Surg. New Series, 18: 36 to 50, 1932.

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## FRACTURE OF THE NECK OF THE FEMUR TREATED BY THE STEEL PIN METHOD OF FIXATION

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*Introduction.* Of all fractures of the extremities of the skeleton, fracture of the femoral neck is the principal cause of disability and death. Our results are too often unsatisfactory and our prognosis always doubtful. It has been termed the unsolved fracture and demands attention and study more than any other bone injury at the present time. Prior to one hundred years ago it was believed that bony union never occurred in intracapsular fractures of the neck of the femur and Sir Astley Cooper recorded only one case in which he had seen good union result. In 1835 the number of anatomical specimens of bony union totaled less than forty in the whole world and grave doubts were expressed as to their authenticity. Now we know definitely that bony union does result in a certain percentage of cases but unfortunately the percentage is still rather small.

*Anatomy.* It is difficult to determine just why so many non-unions occur in the femoral neck. Speculation about interrupted blood supply and increased inorganic content of the bone has long held favor. Recent studies, however, have shown that usually there is a fair blood supply in the normal neck of the femur and that it probably enters from four different sources:

1. The periosteal vessels.
2. The ligamentum teres.
3. The branches of the cervical arteries.
4. The superior nutrient artery.

It is difficult to see how sufficient injury to all these blood supplies can be brought about by the small trauma necessary to fracture the bone. Also, it has been proven that the organic content of the bone is really increased in the aged, averaging about 42% as contrasted with 40%

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earlier in life. This apparently would make the bone less brittle rather than more brittle. We now fall back on the thinning of the bony walls and the increased cavitation of the canal openings to explain the high percentage of fractures but still this does not seem to explain the entire picture.

*Early Methods.* Treatment of this particular fracture has always been and still is rather unsatisfactory. Buck's extension was used almost



Fig. 1-A. Ratchet traction applied by Buck's extension. Canvas strap pelvic counter-traction.

Fig. 1-B. Insertion of pin. Direction and depth of penetration guided by fluoroscope.

universally for about one hundred years and according to reports less than 10% perfect results were obtained. In 1904 Whitman made the first forward step with his abduction and plaster fixation method. This was a tremendous advantage over the previous popular methods but even this has many drawbacks. About 95% of these fractures occur in aged people and they do not tolerate extensive, prolonged plaster fixation very well. The complications of pressure areas, pneumonia, resulting stiffness of the immobilized joints in addition to the hip joint and the rapid loss of weight which usually occurs,

causing looseness of the cast, are undesirable features often encountered. In addition to these drawbacks advocates of this method who have followed their cases for more than two years and have large enough series to draw conclusions of value report from 40% to 60% non-unions.



Fig. 2-A. Case 1. Feb. 9, 1934. Age, 76 years. Before reduction.

Fig. 2-B. After reduction and insertion of pin. (2 or 3 pins are now used)

Fig. 2-C. 1 year later.

Even this, however, is far better than any previous popular method. Enough bony unions have been obtained by the Whitman method to extend studies of what happens to the fractured bone and to draw some conclusions. Four possibilities seem to present themselves:

I. Firm bony union of the fragments.



2. A dead head with no union.
3. A live head with no union.
4. A dead head with union.

The fourth classification, that of union to a dead head, is well established and accounts for many cases which break down after months or even years. After studying a number of x-rays it is possible to prognosticate with a fair degree of accuracy whether a live or a dead head may



Fig. 3-A. Case 2. Feb. 18, 1934. Age, 61 years. Before reduction.

Fig. 3-B. After reduction and insertion of pin.

Fig. 3-C. 3 months later.

be expected after immobilization for three or four months. The solid, dense appearance of the head should always make one suspicious of an aseptic necrosis, while uniform atrophy, nor-

mal after immobilization for several months, points to viable bone.

*Steel Fixation Methods.* With this background it is possible to better evaluate the steel pin method in comparison with other methods. Although nails and screws have been used by various men in the treatment of this fracture ever since the time of Van Langenbeck, Lister, Delbet and Murphy the method received little active support until refined and popularized by Smith-Petersen in 1931. Since that time a number of individual modifications have appeared but the principle of adequate reduction with the fracture held in rigid immobilization with steel reinforcements remains the same. The use of lateral x-ray views as advanced by Dickey in 1916 has enhanced our conceptions of adequate reduction and is a tremendous aid in checking the proper placement of our supports. With the use of the modern shock proof x-ray machines this addition to our visual apparatus is becoming more generally valued. Often what appears as a perfect reduction on the antero-posterior view is woefully lacking when lateral views are studied, and steel supports which appear adequately placed in one view are seen to be worthless when thoroughly checked by a lateral projection view. At the present time internal fixation of fractured necks of the femur with steel supports is the method of choice of many orthopedic surgeons such as Johannsen, Boehler, White, Gaensler, O'Meara, Steel, Telson, Henderson and many others. Each has his own modification of method but the reports of results are uniformly more favorable than with any previous method. Some use Kirschner wires for fixation, others for guides; some use the Smith-Petersen nails and others knitting needles. The principle remains the same. Many make a surgical opening down to the bone; a few do blind nailing.

*Author's method.* The method we have employed is a combination of several modifications and probably there is not a single new, individual feature about it. We have worked at it long enough now that it appears to us to be the safest and simplest method but in other hands other methods undoubtedly are as easy and as fool-proof. The nails we use are made of so-called eighteen-eight stainless steel which has been shown to be the most inert of all usable

metal supports when exposed to the body chemistry. The old Smith-Petersen nails often lost considerable volume in the body and underwent some disintegration. The size of our nails varies according to the size of the patient but in general they run from one-eighth of an inch to one-quarter of an inch in diameter and are about

tainly less trauma. A Henderson or a Magnuson hand chuck is used for the drilling. Attempts have been made to use an electric drill but it was difficult to get the "feel" of the pin entering the head and since the hand chuck works with very little more effort it has been retained. Reduction is carried out on a fluoroscopic table with Buck's extension on the leg fastened to a ratchet traction on the wall.



Fig. 4-A. Case 38. Before reduction.

Fig. 4-B. Lat. view after reduction.

Fig. 4-C. A. P. view after reduction.

six inches long. They are fashioned with a drill point and are not hammered but drilled into the bone. There seems to be less shock and less chance of fragmentation with drilling and cer-



Fig. 2-D. Stable Weight-bearing hip.

Fig. 3-D. Negative Trendelenberg sign. Patient returned to work 4 months after fracture.

Counter pressure is obtained by a canvas strap, well padded, placed over the perineal region and fastened near the head of the table. The Whitman method of reduction is employed except that wide abduction has seldom been found necessary. Satisfactory reduction can usually be obtained by this method but occasionally vertical traction in a flexed position gives better reduction in difficult cases. The reduction is checked by antero-posterior and lateral x-ray views. No anesthetics except morphine and novocaine are used.

After satisfactory reduction has been obtained the area over the hip is surgically prepared and the pins are drilled in under rigid aseptic conditions. The horizontal line of the pin is easily obtained by fluoroscopic view and the pin is pointed slightly upward in the perpendicular plane. When drilling by hand it is, of course, very easy to feel when the pin crosses the line of fracture and engages the proximal fragment. Occasional fluoroscopic views are made to determine the correct line and the depth of penetration, the hands being withdrawn from the



fluoroscope while that is in operation. Two pins are inserted well into the head in the line of the neck and the distal ends are cut with bolt cutters to about three-quarters of an inch outside of the skin. No stitches are necessary. Antero-posterior and lateral x-ray views are again employed to check the placement of the pins. Traction is then removed, the patient placed on a Hawley table and a short, light plaster cast applied extending from the umbilicus to above the knee. This small additional support may not be necessary but it is relatively inconvenient and it facilitates handling of the patient. Many men use no cast at all. Sterile dressings are applied over the pins and no pressure is permitted on the pins. This pressure is avoided by incorporating a large doughnut-like ring of plaster around the pins which can move inside the ring. The patient can be placed in a semi-sitting position and can move the knee at will. After a few days the patient can usually roll over without aid. Except in exceptional cases weight bearing is not permitted until after a three month period has elapsed and the x-rays show satisfactory union. Then the pins are removed and crutches employed until solid union has resulted. If any cast complications arise the cast is removed and the patient's mobility limited.

*Results.* Our series at the present time comprises 42 cases with 27 central neck fractures. The average age is about 68 years and the first case was done February 9, 1934. This case returned to work four months after a central neck fracture. Follow-up x-rays have all been excellent. We have one definite non-union in a case done over two years ago, the breakdown occurring only a few months ago, after the eighty-one year old patient had been walking and had resumed her natural activities for more than a year and a half. This non-union only emphasizes the futility of trying to evaluate the results of any series of central neck fractures in less than two years after treatment. We have three heads which appear non-viable but with apparent union. No other non-unions have been encountered. One infection occurred in a case in which a senile patient worked his hand inside of the cast down to the pins. This infection was a contributing cause of his death. In the series of 42 cases five others deaths have oc-

curred, none of which was attributable to the treatment of the fracture per se. Subtracting the five cases which expired from other causes and six cases in which it is too early to determine the union and one case which disappeared and on which no check-up was possible, we have thirty cases left to consider. Of these cases we may count as failures the three non-viable heads, the one non-union and the one infection. This leaves as failures 20% and as successes 80%, which figure, while lower than that reported by many using similar methods, is still well above the average obtained by methods previously used.

#### CONCLUSIONS

Whether the rigid immobilization with prevention of rotation of the head is the prime factor, as claimed by many, or whether the drilling is an aid to union as claimed by others, it appears that the method of steel pin fixation in femoral neck fractures offers not only a higher chance of union but a better method of preventing the various complications incurred in the aged by long recumbency or extensive plaster fixation.

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#### THE WHITMAN SPICA CAST IN FRACTURES OF THE NECK OF THE FEMUR

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PEORIA, ILL.

For many years the so-called Whitman spica cast has been almost universally used in the re-

Read before the Section on Surgery, Eighty-sixth Annual Meeting, Illinois State Medical Society, Springfield, May 19, 1936.

duction and fixation of fractures of the neck of the femur. As has been emphasized in the previous discussions the fractures in the region of the hip other than those actually through the neck, offer no great problem as they practically all unite if given reasonable replacement and fixation by any method. My discussion therefore will be strictly limited to the old age fracture, the fracture directly across the neck of the femur.

It is sadly true that any method used by many surgeons and during many years of practice is apt to become badly distorted. I am sure that we have all seen many, many casts applied supposedly by the method of Royal Whitman, which have strayed far afield. Sometimes this is consciously done in an effort to improve upon the established method, but oftener, I am afraid, because the fundamental principles set down by Whitman were forgotten. The inaccurate and inefficient use of a method is very apt to give bad results. These bad results should not be used to discredit the method.

Some years ago Henderson reported that in a group of 144 cases of ununited fracture of the neck of the femur a history of inadequate treatment was obtained in nearly all.

As this symposium is intended to bring out the comparative value of the various methods used in fixation of fractures of the neck of the femur, it is hardly necessary for me to go into the method of reduction of the fracture, as practically the same manipulation is utilized by all of us. There are a few points, however, which merit reiteration.

The clinical picture when the patient is first seen is a very familiar one. The patient is usually an elderly person, often an old woman. She lies on her back with the affected leg slightly flexed at the hip and knee. The leg is externally rotated so that the outer side of the foot and leg lies on the bed. There is usually some shortening. A Rentgenogram of the hip shows a fracture through the neck. Right here I want to emphasize the fact that an apparent shortening of the neck in this rentgenogram does not indicate an impaction of this fracture. Impaction of these fractures is a clinical conception, or misconception, usually based on the inability of the examining physician to feel crepitus in the fracture plus the apparent short-

ening of the neck as shown by x-ray. In my opinion impaction in these fractures, if it ever occurs, is exceedingly rare. Of course, incomplete fractures do occur without displacement, and of course, require no reduction.

The shortening of the neck of the femur seen in the x-ray is produced by the external rotation of the leg, which causes the fractured end of the neck to be turned forward so that the antero-posterior view no longer shows the neck in profile, but actually looks into the fractured end of the neck. This external rotation of the shaft of the femur brings the lesser trochanter into prominence in the picture. If the x-ray shows both hips, the lesser trochanter on the affected side will be in profile, and will show up much more prominently than in the normal hip. Whenever, therefore, the clinical picture is the classical one, described above, with external rotation of the leg, the hip is not impacted. In my opinion, in the care of fractures of the neck of the femur the possibility of an impaction being present should be disregarded. The accurate adjustment of the broken surfaces brought about by the method of correction used by all of us not only does not endanger a union, but actually is the only means of giving a chance of a union.

The manipulation which I employ is the one described by Dr. Ruth, who advocated the old Maxwell-Ruth method of treatment of these fractures. It is done ordinarily under some type of anesthesia, with the patient lying on a fracture table with the well leg attached to the traction apparatus in fairly full abduction. The affected leg is grasped firmly and flexed to a right angle at the hip and knee. With one hand under the knee, and the other under the great trochanter the leg is lifted, not powerfully, and rotated into good internal rotation. With the leg and hip muscles relaxed by the flexed position, this is rather easily done. Without relaxing the lifting force, the leg and hip are gradually brought into full extension and wide abduction, the lifting force gradually changing to one of longitudinal traction until the reposition of the fragments is actually locked into position by the abduction and internal rotation. Whitman's original theory was that the full abduction actually caused the great trochanter to impinge against the pelvis. Certainly the abduction



which we employ, and which he described in the application of his cast, is not sufficient to cause such an impingement. If there were such an impingement I believe it would tend to separate the fractured ends rather than push them together. The locking of the fragments into position is caused I believe, by the tension of the supporting muscles and ligaments about the hip joint, the greatest strength being supplied by the tension on the adductor group of muscles.

With the leg in this position the application of plaster is a simple matter if certain fundamentals are kept in mind. The abduction, internal rotation and extension must not be relaxed during the application of the plaster. The knee is slightly flexed to relieve the strain without any flexion of the hip, however. This slight bend makes the internal rotation easier to hold. The position seems to give a solid fixation of the fragments. This fixation, however, is only temporary, and would be lost very soon due to the tiring of muscles. The firm fixation must therefore be held by the plaster.

For this reason the plaster is extended high on the chest on the side opposite the fracture. If the Whitman single spica cast is used, abduction of the leg can not be retained unless this is carefully adhered to. We have all of us seen casts applied after a good reduction in which the only mistake made was that the cast extended up only to the waist line. Immediately after the application of such a cast the affected leg may be brought over to the mid-line and the band about the pelvis and waist simply slides up and 90% of the abduction is immediately lost. In my opinion, the failure to extend the cast on the well side up to the nipple line is one of the outstanding reasons for non-union in these fractures and is an argument against inefficiency in application, not an argument against the Whitman spica. If the Whitman cast is applied high on the side opposite the fracture, is molded snugly over the great trochanter and extends to the toes on the fractured leg the fixation is not only immediately perfect, as can be proven by x-ray, but is exactly the same three months later, when the cast is usually removed. There is some difference of opinion as to the length of time following the removal of the cast before unprotected weight bearing can be allowed. This time period would be the same whether the

Whitman or some other method were used. It is at this time after the removal of the retentive apparatus, or cast, that considerable judgment must be exercised. If there is a union at the end of the three-month period, certainly it could not be regarded as a solid one and the general feeling is that weight bearing earlier than six months from the time of the fracture should rarely be allowed, and in many cases protection from full weight bearing should be kept up for a year.

In determining the duration of the fixation and the prognosis in fractures of the neck of the femur, there are certain factors which must be taken into consideration. These factors which affect the ultimate union of the fractured ends are, of course, present whether the case be treated by the Whitman method or not. However, I wish to touch on them because it is my belief that there is no non-operative method of treatment which so definitively takes these factors into consideration as that of Whitman. The first factor is the much discussed circulation in the head of the femur, and the obvious disturbance in this circulation when the head is broken loose from the shaft and temporarily, at least, must get its blood supply from elsewhere than through the neck.

The second factor and a very important one is the plane of the fracture. In many cases this plane is practically parallel to the line of the shaft and therefore parallel to the line of force applied either when weight is borne on the leg or when the muscles about the hip either relax from too great pull on the fractured leg or contract from too little pull. In other words, there is a natural shearing force working in fractures of the neck of the femur which is practically never present in the usual fracture of the shaft of a long bone where the plane of the fractured surface is more or less perpendicular to the line of force and where weight bearing or the pull of muscles simply tends to force the fractured surfaces more tightly together.

Now what can the Whitman method offer toward the re-establishment of circulation in the head of the femur? It offers the one thing which we regard as necessary in any fracture, and that is firm, snug apposition of the fractured surfaces. The unvarying abduction and firm molding of the plaster over the trochanter gives

this pressure of the raw surfaces together as no other method can possibly do. By that means we do all that is humanly possible to encourage the development of new blood vessels into the head.

Again this firm plaster fixation completely stops movement at the fracture site from the contracture or relaxation of the muscles about the hip joint, and during the fixation eliminates the shearing tendency caused by the fact that the plane of the fracture is parallel to the line of force.

Now I want to say just a word about this mechanically beautiful apparatus known as the well-leg splint. We will grant that the x-ray of the fractured hip directly after the fixation by the Roger Anderson splint is perfect. But after all this reduction was not produced by the splint. The splint is a method of fixation, not reduction. The reduction was done by the doctor and it was good. We feel of the hip and the whole apparatus during the first two weeks following its application is firm and the fixation seems absolute. The x-ray shows some abduction, but certainly not the complete abduction necessary to cause a locking of the fractured fragments in position. What then gives this apparent complete fixation? It is purely muscle tension produced by the pull on the fractured leg and the push against the normal leg. During the first few weeks, while the muscles are still in some spasm and have not become tired out the fixation is good. The cross pull of the adductors draws the neck tightly against the head. As the days go by these muscles tire out and there is no force left to push the fractured neck against the head and our first factor necessary to re-establish circulation is gone.

Now with regard to the shearing strain at the fracture site due to the plane of the fracture lying parallel to the line of pull and push of the splint. Dr. Anderson himself states that the hip must be watched by x-ray and the tension kept up to a certain level. In other words, we have a fracture line lying parallel to a sort of balanced system of muscles and spring and screw apparatus and hope to keep this balance accurate enough to allow the re-establishment of circulation, and a solid union between the fragments.

Perhaps in the hands of Dr. Roger Anderson

this accuracy of balance is possible. I doubt it. In my hands it is not possible. Time after time I have felt of the leg and retaining apparatus at the end of the fifth or sixth week, and found the whole so relaxed that eight or ten turns of the screw in the traction apparatus may be made without the patient knowing anything about it. Such a system does not give the fixation necessary to give a union in a fracture of the neck of the femur. Time after time I have seen a slight shift in the position of the head with reference to the neck of the femur in the x-ray, and by means of a few turns of the traction device have put the head back in the original beautiful position. This is the adjustment which admittedly is necessary in using the Roger Anderson apparatus. But if the movement is sufficient to be seen in the x-ray isn't the damage to the newly forming blood vessels and callus already done?

Recumbency in a Whitman spica with the cast to the nipple line on the side opposite the fracture is sometimes difficult for very old people to stand. In fact occasionally I have been obliged to use a double spica cast in some of these old people in order to cut the cast low over the abdomen and even allow a partly sitting position. Occasionally too I use the Roger Anderson splint for a few weeks until the very old person is past the period of acute pain and spasm, recognizing that the life of the patient may be saved even though the fracture never unites. It is my firm belief that the same firm fixation is necessary in fractures of the hip which is necessary in all other fractures, and that up to the present time the Whitman spica has no real competitor in the care of fractures of the neck of the femur.

#### DISCUSSION ON PAPERS OF H. D. JUNKIN, H. A. SOFIELD, AND H. E. COOPER

Dr. Paul B. Magnuson, Chicago: It saddens me not to be able to start the dog fight which your Chairman hoped to see, but I feel that all the papers read here this afternoon have been presented in a most fair and impartial manner, and certainly each of the methods is a well-accepted method and has a place in the treatment of fractures of the neck of the femur. After all, the object of any treatment is to cure the patient of his ills, and no one method would be suitable for all cases. So that each has a definite place.

It is my opinion, however, that most of us talk methods and advance methods and try to sell methods, when what we should be trying to do is to determine



which case any of these methods will best fit and produce the best result for the patient. We have not arrived at a point in medicine where this is easy, no matter what disease or injury we are treating. What is one man's meat is another man's poison, whether one is treating allergy, constipation or fractures.

In choosing a method of treatment for any condition certain fundamentals must be considered. For instance, if one had a very obese, aged patient, where a Whitman cast could not be applied with any hope of maintaining the fracture in position, it would be folly to choose the Whitman method. And I believe this method is suitable for a limited class of patients. Certainly the reduction of the fracture first, before any method is used, is one of the most important steps in obtaining a good result. I do not think the application of a Whitman cast in the position described by Whitman is a good method of reduction. The Leadbetter manipulation is much more effective, and the reason for this will be apparent when one looks at the anatomy. When the neck of the femur is fractured there is immediate distension of the capsule by blood and synovial fluid, followed by secretion of more synovial fluid due to the irritation caused by the fracture. This bulges the sides of the capsule and consequently shortens it—in other words, the distance between the edge of the acetabulum and the base of the neck, the two attachments of the capsule, is lessened. Therefore, in order to bring the ends of the fragments together, traction should be made in a position which will allow the greatest latitude of motion. The capsule is most relaxed in flexion, therefore the traction should be applied while the thigh is flexed on the pelvis. After the ends are brought into apposition then the knee can be brought out, the thigh abducted and the leg brought into extension. In this position the Y-ligament is pulled tight and the adductor muscles are put on the stretch. If the fracture through the neck is transverse and the reduction has been anatomically perfect, the tension on these two structures will press the fractured surfaces together and practically lock them, but if the fracture is oblique, as is frequently the case, the tension on the adductor and Y-ligaments with the leg in full extension will have a tendency to push the fragments past each other, and anatomic reposition cannot be maintained. Especially is this true if the neck is fractured in a line running from the inferior surface near the head to the superior surface near the base of the neck. Cancellous bone does not break in any set or pre-arranged angle and the lines of fracture are frequently hard to follow. It is my opinion that x-rays should be made at four different angles, one in the straight antero-posterior, one lateral, and two between these positions, both before and after reduction. It is absolutely impossible to take these angling x-ray shots when the leg is fixed either in the Roger Anderson or Whitman position. Therefore, I think many of the fractures in which we claim anatomic reduction, and in which non-union results, will be found on closer investigation not to be anatomically reduced.

As to the Roger Anderson method, the maintenance

of the position of the fragments is entirely dependent on traction pulling down on the leg on the affected side and pushing up on the well leg. This will hold a moderate amount of abduction, but after the swelling in the capsule disappears the fragments can be separated sufficiently to allow synovial fluid to bathe the ends of the fragments and create a gap between them, which nature cannot bridge with callus because in this location there is no blood clot to act as a structure for such bridging. The circulation of the hip, too, has much to do with non-union. Walcott has shown that blood enters the neck of the femur and the head of the femur not only through the small artery in the ligamentum teres but through the capsule of the joint, and the entrance of this circulation is entirely confined to the posterior upper and posterior lower part of the visceral capsule. If the line of fracture starts on the posterior surface of the neck near the head and runs obliquely forward and outside, the major portion of this circulation is cut off from the proximal fragment, that is, the head and the portion of the neck attached to it. So one would feel that in this type of fracture there would be less likelihood of obtaining union than in a transverse fracture through the exact middle of the neck where there was not sufficient tearing of the visceral capsule to interfere with the blood supply.

Internal fixation by nails, wires and bone graft, has undoubtedly come to stay. Blind nailing does not appeal to me as a sensible and logical method of treatment. There have been some good results reported from this method and the percentage of unions has been much higher than with any other. When one starts to look for the reason for this, he is inclined to the belief that if the two fragments are brought into anatomic reposition and firmly fixed there so that there is no chance for leakage of synovial fluid between the fragments, if the fragments are held firmly in normal relation to each other, and if there is a mechanical stabilization which allows the upper fragment to follow the lower fragment in every movement of the patient's body, the percentage of unions should be much greater under these conditions than under more hit and miss methods.

No method is going to produce 100% unions in fractures of the neck of the femur. Many patients are poor surgical risks under any conditions. Therefore in choosing THE method to use on A patient, the patient's physical structure and physical condition as well as the anatomic and mechanical difficulties to be encountered should be considered before any one method is chosen for that particular patient. There will never be agreement, but if we study our cases from the standpoint of the possibility of maintaining anatomic reposition of the fragments and the ability to hold this anatomic reposition of the fragments for a sufficient length of time for union to occur, there will be many more good results following fractures of the neck of the femur than there have been in the past.

Dr. F. J. Otis, Moline: I wish to say a few words on the home care of the intracapsular and other fractures of the leg. The important considerations are:

first, efficiency; second, comfort to the patient; third, comfort and ease of operation for the nurse; and fourth, ease of accomplishment for the physician. If a method cannot reach this standard, although it may be good it may not be usable.

Note for a moment the efficiency our professors taught us in Buck's extension. However, it required placing the patient on a board or placing boards under the mattress to effect the proper efficiency. But it took the comfort away from the patient, and it was extremely difficult for the nurse to handle.

Professor Murphy used the Rainey's tripod and became very proficient. His staff were artists in handling the patient in bed. He also used the tripod cast. But it was difficult for us to duplicate his efficiency. Therefore we took note of the young men who had found difficulty in helping the nurses manage these cases. Even with the proficiency of the Whitman cast, maintaining excellent position in the 45 degree angle, it was hard for the nurses to handle the patient. So there developed some methods of suspension of fractures and lively competition between the advocates of Davidson's suspended cast and the Hodgen's splint.

The suspension principle was sound for giving comfort to the patient and assisting the nurse. It is important to notice they recommended a suspension close to the mattress. You will see considerable traction can be secured from the traction on the calf by the slight flexion of the knee. This traction would amount to from five to eight pounds, and often during the convalescent stage, when all adhesive extension has been removed, this mild traction may be maintained by cradling the limb in this splint. You will notice those advocates required the pull at a 45 degree angle. Analyzing a 50-pound pull, 25 pounds goes for supporting the leg in the hammock and another 25 pounds is exerted through the skin traction to the bone with a little supplemental assistance from the traction behind the calf. This is important also because it secures such efficient traction one will not so early be required to resort to skeletal traction. This is more difficult to carry out in the home than the non-surgical procedure.

With the Balkan frame came the Thomas splint, and there developed a great error of elevating the limbs high. The skin traction was wasted in supporting the limb so only a little traction was left to be applied to the bone. Thus it became necessary to use the Steinmann pin and Kirschner wire, which we did not want to use in the home. Therefore, in the home we kept the legs horizontal.

However, the nursing problem was a real problem. As many of these patients were very old we had to place some in the Bradford frame. It occurred to us that these Bradford frames might be attached in the Balkan frames. So we devised a Balkan frame that could be placed on any bed made in the last hundred years except the trundle bed. There were pads to protect the bed. Any member of the family could elevate the patient up and down with ease. The nursing problem became quite simple.

The next question which arose was how could we

make it easy of accomplishment for the doctor. We were very much delighted to note there was enough mechanical ingenuity associated with any hip fracture to utilize, so we conceived the idea to have them nominate their mechanic. We had him inspect a frame already in operation, and then take the materials and set them up. It was surprising how quickly he reported the frame ready for use. We were even further astonished to note, when the supply was exhausted, how readily they could reproduce another frame and report it ready and in position. The frame has so few parts—only a few little wing nuts on stove bolts, a simple clamp or two to tighten and you have constructed the whole thing. It is very economical. Manufacturing firms had preceded us in the idea with a rather expensive bed. These were supplied in such limited quantity that only one patient could be accommodated. This made it necessary for us to transfer some of these frames to the hospitals. There we achieved another great success. The convenience to the nurse was so appreciated by the nurses that they went to great efforts to get the doctors to use these frames. Then the hospitals developed a supply of them and for teaching purposes they kept one set up. This was also a convenience to us who were doing fracture work in the home. When we had no frame, we sent a friend of the patient and a mechanic to the hospital to inspect the set-up frame. Soon we had another frame set up at home, saving much of the doctor's time.

In the hospital the doctors had some of their own frames and often chose to put them up, but they had to do it themselves. These did not include the Bradford frame, and in order to have this Bradford frame the nurses volunteered to have the frame all set up waiting for the doctor. This was an astonishing convenience and so successfully carried out by the nurses that I was surprised to observe two probation nurses carry an outfit into the room. It was not long until it was set up and the doctor had been required to spend only a few moments in suspending the limb in the frame.

I will present to you one case which is typical of the results attainable in the home. This is a patient who incurred an intracapsular fracture. The x-ray check showed the limb held in most excellent position. Six months later it had organized with a slight shortening, but with possibilities of very little deformity. Unfortunately, at this time she and her husky son attempted to pass through a swinging door at the same time. As a result of the fall she sustained a fracture through both trochanters, and an apparent weakening of the intracapsular fracture. Again the Thomas splint, swung low as the Hodgen's splint had been before, pulled the parts all into perfect alignment, even breaking up the impactions. The neck, which apparently was badly strained and impacted on its lower surface, was loosened and realigned in quite perfect position by this efficient traction. As the patient had already become an artist in the use of the caliper, and as it was an extracapsular fracture, she was per-



mitted to get up a little sooner, but was not allowed to bear weight on the limb for a year.

Some months after the second fracture we have quite a perfect result. There is practically no shortening, but when compared with the picture taken several years later you will see that even after the seventh month there was a little shortening of the neck from the weight-bearing which was eventually applied. In the end, however, we got a very perfect result functionally. The x-ray picture shows the rearrangement of the structural lesions of the bone, and emphasizes to us again the importance and absolute necessity of nature withdrawing all that old bone and building a new one, with new and proper lines of stress that will meet the needs of the individual.

Dr. C. Paul White, Kewanee: I want to ask Dr. Junkin to talk about the pain in the knees which patients have with the Roger Anderson splint. How long does it take to get them back to using the knees? It seems they have so much pain in the leg around the knees in my experience—I have seen none in a rather small series that did not have more or less pain which was very aggravating, in the knee on the injured side.

Dr. H. D. Junkin, Paris (closing): During many years out in the country I have followed Dr. Magnuson's work very closely, and the work he has done has been monumental. Such men as he are responsible for the fact that out in the country we think more about the treatment of fractures, and we appreciate what the Fracture Committee of the American College of Surgeons and the authorities on fractures have done for us. I thank Dr. Magnuson for his constructive criticism.

I was particularly pleased to hear Dr. Sofield's paper. It seems to me that if the Roger Anderson splint was applied to pull the leg down, then put the pins in and keep the splint on for a few days or weeks, we would find it very useful.

Dr. Cooper mentioned the fact that the Anderson Splint depended upon muscular traction for reduction. The fact is, all of the Whitman Technic is carried out and the reduction is strictly skeletal. This I feel was well demonstrated in the lantern slide showing the splint applied to the skeletal structures. If an end to end reduction is effected, a certain amount of relaxation would be beneficial and would place the fragments in closer apposition. We have found it necessary to release traction rather than to put more traction on following reduction. In our experience with the Whitman dressing, much relaxation and slipping in the cast always occurred. Most of our patients got along very poorly because of the cast extending onto the chest which we felt was responsible for the frequency of hypostatic pneumonia.

Dr. Oliver of Kewanee asked me about the stiffness in the knees and pain in the hips following the use of the Anderson splint. It is true that patients experience some stiffness in the knee, particularly the old patients, but the pain is more in the well leg than the injured leg. There is a little point that I got from

Dr. Anderson: that is to turn the feet out rather than in; when the cast hardens you will have the pressure evenly distributed on the feet and a great deal of the pain will be obviated. Cut a fenestra over the patellae and then freely move the patellae every day. Much of the pain will be eliminated. Most patients complain of pain in the well leg, not the injured one. Here diathermia offers much relief. With the short wave diathermia heat is passed directly through the cast into the soft parts. Then, the fact that the Anderson dressing permits the patient to be up in the wheel chair and the frequent change of position of the lower extremities relieves much of the pain. Another point—the cross bar can be arranged to give increased abduction by using a long iron which you can have made by any blacksmith. This increased abduction is desirable in certain neck fractures and in various reconstruction procedures about the hip.

Dr. H. A. Sofield, Chicago (closing): I think Dr. Junkin's suggestion of using a Roger Anderson splint to bring about reduction before putting in the pins would be a good idea if you did not have other material available at the time. The lateral x-ray is all important. I have seen what appeared to be perfect reduction in the anteroposterior view and then when a lateral is taken, found it off entirely. It is pretty hard to figure how the Anderson splint brings the trochanter forward in order to oppose the head. I do not think you need absolutely perfect reduction to get union. Walcott's study on the circulation has been pretty revealing. Some men drill through the head and then remove the drills. The main objection I have had to the Whitman cast is the fact that you cannot hold the bone in perfect alignment unless you run the cast up over the shoulders, because you always have slipping up of the pelvis, particularly in stout patients, and in older patients treatment with a Whitman cast is almost as severe as the fracture itself.

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## FAILURES IN NATURAL CONCEPTION CONTROL AND THEIR CAUSES

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It was in the fall of 1932 that we first began to advise women how conception could be avoided by practicing abstinence during the fertile period. By correspondence, more than 25,000 women were contacted. Up to the present time, 59 complaints have been received from users of the method. They stated that they became pregnant against all expectations after using the Ogino-Knaus biological law. Since about 95% of these women, representing all walks of life, were not seen clinically, it was

necessary to collect our information from written records. We did not always get all the facts desired, but the great majority of these women cooperated in a most commendable manner, so that we are in a position to clearly classify most of these cases.

The cases of involuntary pregnancy brought to our attention can be divided into the following groups:

A. Two actual failures.

B. Twenty-three women erroneously had intercourse during the conception period (for details see Table 1.).

C. Thirteen women had an insufficient menstrual record (from one to four months). Some of these cases are illustrated in Table 2.

D. Fourteen women proceeded to use the method without any menstrual record at all.

E. Two women used the method immediately after childbirth.

F. One irregularly menstruating woman.

G. One pathological case (inflammation of the cervix).

H. Three pregnancies due to mental shock, change of climate, and marked variation in physical habits, etc.

#### GROUP A.

Case A-1. A woman, 32 years of age, two children, slight leucorrhea but otherwise in good health, with a menstrual cycle varying between 29 and 35 days, used a formulated type of Concup Calendar successfully for two years. The last menstruation before conception, began December 13, 1934. According to her cycle, the conception period extended from December 24 to January 3. Intercourses took place on December 18, 20 and 22, and on January 7, and thereafter. On the morning of December 19, this woman fell down a flight of stairs, fourteen and a half feet high, and immediately thereafter experienced sharp pains in her abdomen, so that she feared she might have incurred a rupture. Physical examination did not disclose a hernia. The unusual fact was that she became pregnant during the month of December, and aborted about March 10, 1935. One might conjecture that the fall brought on an earlier ovulation, either by direct pressure on the ovary or by strain, and one of the intercourses executed during the second part of December caused a pregnancy.

We reported this case to Professor Hermann Knaus, who gave the following opinion: "This failure is due to the accident the woman experienced post menstruation; it is, however, very remarkable, because it is the only failure in this field that ever came to my knowledge." (Knaus' letter of May 4, 1935). In June, 1935, this woman resumed the use of the Ogino-

Knaus method and has not experienced any trouble with it at this writing.

Case A-2. A woman, 32 years old, four children, with symptoms of a mild form of secondary anemia, by an eight month record established a menstrual cycle varying between 26 and 30 days. She admitted, however, that shortly before the commencement of this record she had a cycle of 32 days. In all menstruations, the flow lasts about three days, then practically ceases for one day, and is then resumed for three days. The last menstruation before the undesired pregnancy occurred, began on June 5, 1935. Intercourses took place on June 10, 11, 26, 28 and 30. All of these intercourses were definitely outside of the fertile period, but still the woman became pregnant. Apparently, no other intercourses were had except on the given dates. In considering the menstrual behavior of this woman, there was a question in our mind, whether to place this case in the pathological group or under actual failures. A more exhaustive questionnaire to the patient and her family physician has so far been unanswered.

#### GROUP B.

Twenty-three women erroneously or carelessly had intercourse during the conception period and became pregnant. The details of these cases are summarized in a self-explanatory way in Table 1. (It should be noted that the part of the table enclosed by the hatched line represents the fertile period.)

Several of these women had too short a menstrual record at the time of their conception, and should not have begun the use of the Ogino-Knaus method when they did. Since they had cohabitations during the conception period, as figured from their given cycles, they are shown in this group.

Case No. 11, of Table 1, is of special interest. The woman is 28 years old, apparently normal, and in good health. Her cycle varies as follows: 27, 27, 30, 33, 30, 31, 28 (marriage), 41 (took a vegetable compound and medicine to bring on menstruation because of a suspected pregnancy), 34 and 26 days. The next menses started November 5, 1933. Cohabitation occurred November 13 and 14, and again after November 26. Conception apparently occurred on November 13, or 14, (ninth or tenth day of cycle) and a normal child was born August 8, 1934. After the birth, her menstrual cycle continued as follows: 44, 30, 27, 27, 27, 29, 33, 27, 27, 28, 28, 26, 28, 27, 26, 27, 27, 32 and 27 days. After her pregnancy, the woman used a Concup Calendar (26 to 35 day cycle) successfully for the next twelve months and in January, 1936, she began to make use of a 25 to 33 day cycle.

It is worth while to note in this case that the cycles before and after marriage and pregnancy are approximately the same. At any rate, they are within the established upper and lower limits. It also shows clearly that intercourses executed during the fertile period led to pregnancy, but when abstinence was practiced during the conception period, there was no pregnancy for at least nineteen months.









it is readily observed that the slightest variation of these cycles may lead to conception. These failures confirm us in our rule that a record of only a few months is not sufficient in establishing the variation of the cycle. Here we might look at Table 3, which shows the menstrual cycles of women who kept a record of the dates of the beginning of menstruation for at least eight months, or more, before the Ogino-Knaus method was used.

#### GROUP D.

Fourteen women proceeded to practice natural conception control without any menstrual record at all and became pregnant. As they did not have a written menstrual record or a record of the dates of cohabitations, it was impossible to check these cases. However, they prove that a written memorandum is necessary before the method can be used successfully. Memory cannot be trusted in these matters.

#### GROUP E.

Two women became pregnant when practicing the Ogino-Knaus system immediately after birth. One of these women waited for one menses post partum and then abstained during an assumed fertile period based upon a four months record kept previous to the last pregnancy. It is a known fact that the first two or three menstruations following birth do not always occur with the accustomed regularity (see also Cases No. 333, 340, 371 and 379 of Table 3). During the first two or three menstrual months after a birth, the sterile period cannot, therefore, be determined by mere computation.

The second woman believed that she could not become pregnant as long as she did not menstruate after childbirth. However, she conceived during this period of time and no menstruation occurred between two births.

#### GROUP F.

One woman with an irregular menstrual cycle varying between 27 and 43 days cohabitated on the 10th and the 20th days of the cycle, as well as before and after these days. Pregnancy occurred because several of these intercourses apparently fell into the conception period.

#### GROUP G.

A woman with a three months record, indicating a 27 to 29 day cycle, was under treatment for inflammation of the cervix and had been advised by her physician that she could not depend upon the Ogino-Knaus method at that time. She disobeyed instructions and became pregnant apparently during the time she received treatments (diathermy). Case No. 143 of Table 1, Vol. 105, p. 1244, J. A. M. A., is interesting in this connection. It shows that some unnatural interference, such as physical therapy, may temporarily upset the regularity of ovulation and menstruation.

#### GROUP H.

Case H-1. Patient used method successfully for about two years. Last menstrual date prior to conception was December 26, 1935. Patient was able to

furnish records of only five previous cycles. The intervals were 26, 26, 26, 26, and 29 days. In 26 to 29 day cycles, the first eight days would be sterile, the following eight days fertile, and the remaining days until menstruation would be sterile. The only intercourses recorded in the menstrual month starting December 26, were on January 1, (seventh day of cycle) and on January 14, (twentieth day of cycle). Both of these dates were outside of the fertile period, as determined for cycles of 26 to 29 days. These limits, however, were based on the limited record, as given, of only five preceding menstrual cycles. Detailed correspondence brought out as the only further important circumstance that very strenuous dieting and exercising were being followed at the time conception occurred. We believe that injudicious dieting, coupled with unusual bodily exercises may cause a disturbance of ovulation. Likewise, a previous written record of only five months before the use of the Ogino-Knaus method is insufficient.

Case H-2. Patient, wife of a physician, aged 24 years, married November 16, 1935. The recorded menstrual cycles beginning with September were as follows: 33, 23, 31, 28, 27 days. The last menstruation occurred on February 11. Patient's husband met with an auto accident February 28, which shocked the wife severely. Although all subsequent intercourses supposedly were in the sterile period, no menstruation occurred. Here again the sudden fright around ovulation time may have caused a delay of the rupture of the follicle and the insufficient written record of the cycles were not conducive to successful application of the method.

Case H-3. Patient, 34 years old, with a 22 to 28 day cycle, used the Ogino-Knaus method successfully for about one year. The supposedly last menstruation before conception started March 5, 1935. The menstruation prior to the mentioned one began February 11. Cohabitations took place March 2, 3, 27, 29 and 31. All of these intercourses were definitely outside of the computed conception period, but the woman became pregnant and a normal child was born December 5. The month of March was spent under usual and ordinary conditions; however, during the second part of February the woman had a bad fright, experienced a change of climate and was under a severe mental strain. The duration of the menstrual flow was usually five days, but the bleeding beginning March 5, lasted only three days and was scanty. It is therefore questionable if the bleeding of March 5, was a regular menstruation. If conception would have occurred on March 27, or thereafter, the duration of the pregnancy would be only 254 days or less. It is likely that the fright, change of climate, etc., caused a delay of ovulation in the month of February and the cohabitations on March 2, or 3, resulted in pregnancy.

*Comment.* Case No. A-1, is an actual failure. Case No. A-2 may also be a failure, but on account of its pathological nature it might be outside the pale of the normal and therefore not suitable for the Ogino-Knaus method. All the

other cases experienced and reported in toto are the result of a definite violation of the rules governing natural conception control and cannot be considered failures of the Ogino-Knaus system. In fact, the great majority of these cases are proof that the Ogino-Knaus biological law is correct. The few complaints received from the many users, constitute an extremely

small fractional percentage, so that we feel justified in considering natural conception control when used by normal healthy and regularly menstruating women, as reliable.

Since our last publication in the Journal A. M. A.<sup>1</sup>, 1,500 additional menstrual records have been collected, 100 of which are shown in Table 3. These records were kept for a period of not

TABLE SHOWING NUMBER OF INTERCOURSES EXECUTED DURING THE STERILE DAYS OF LISTED CYCLES.

TABLE 4

[illegible]



less than eight months. The individual cycles of some women are as short as 20 days and cycles of other women are as long as 40 days. The individual variation of 90% of these women, however, does not exceed eight days. The variation of the menstrual cycles of these 1,500 women are as follows:

4 per cent. of these women vary	3 days
9 per cent. of these women vary	4 days
24 per cent. of these women vary	5 days
23 per cent. of these women vary	6 days
18 per cent. of these women vary	7 days
12 per cent. of these women vary	8 days
5 per cent. of these women vary	9 days
2 per cent. of these women vary	10 days
1 per cent. of these women vary	11 days
2 per cent. of these women vary	more than 11 days

100 per cent.

This type of records collected over a period of several years indicates that the menstrual cycle may be temporarily upset by a disturbance such as sickness, physical or mental shock, unusual exertion, great change of climate or altitude, etc. It also shows that, after the disturbance is passed, the cycles usually return to the accustomed regularity. We, therefore, are inclined to believe that the menstrual cycle of the fully mature, normal, healthy and regularly menstruating woman, once determined, stays within the established limits until the onset of the menopause and is amenable to the use of the Ogino-Knaus method of natural conception control.

*Confirmatory Data.* In Table 4, which is self-explanatory, we have shown 11,222 intercourses, executed by 265 women over a total period of 2,353 months, during the sterile period, without the occurrence of a pregnancy. This material was sent voluntarily by users of the system, who were supplied with a small Record Calendar (as devised by us) and instructed to mark the dates of the beginning of menstruation as well as the dates of intercourses.

The entire confirmatory material published herein has been collected after the publication of the article, "Natural Conception Control,"<sup>1</sup> All told, we have now accurately kept records of 379 women who had 15,924 natural intercourses during the sterile period without the occurrence of a pregnancy. In opposition to these confirmatory cases, few failures are recorded. One of these failures was definitely caused by physical shock (fall) and is undoubtedly a bona fide case, the remaining case is questionable.

## CONCLUSIONS

1. At least 57 of the 59 apparent failures are not due to defects of the method of natural conception control.

2. The 11,222 intercourses, executed by 265 women during the sterile period, are further proof that the Ogino-Knaus method of natural conception control is practical and reliable.

209 South State Street.

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## THE RATE OF DISAPPEARANCE OF BACTERIA FROM THE SKIN OF THE NORMAL EYELIDS AND THE NORMAL CONJUNCTIVA

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One of the most exposed surfaces of the body is the mucous membrane of the conjunctiva.

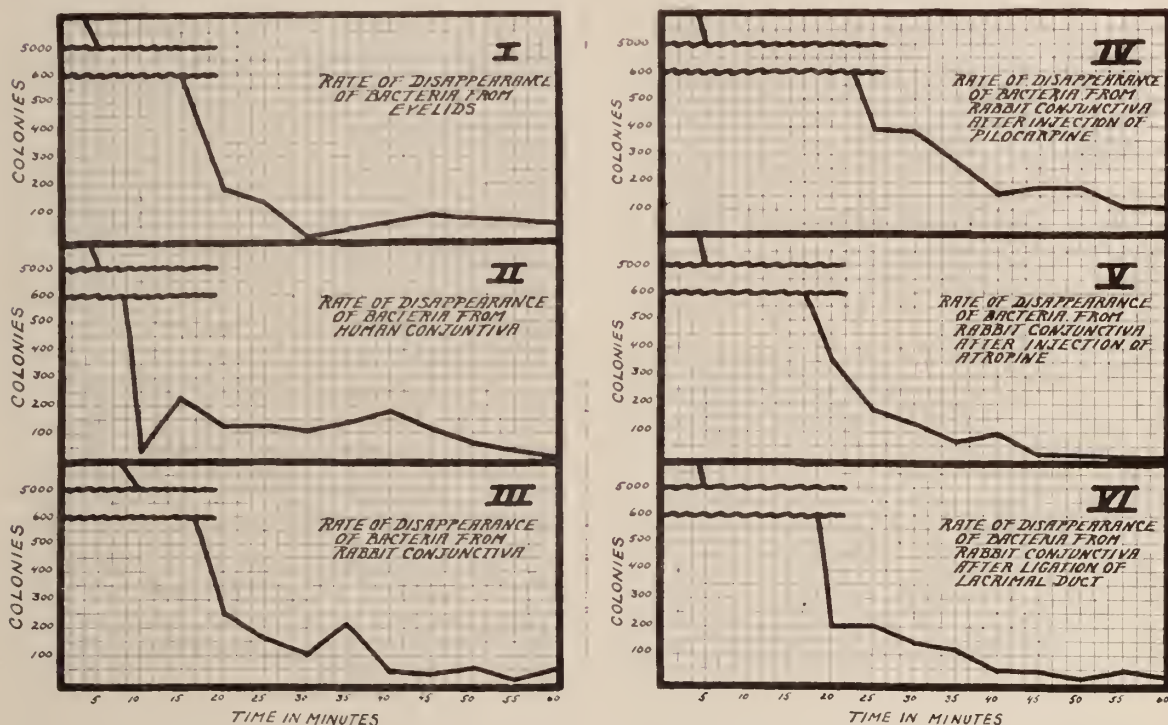
Although it is protected from the entrance of large foreign particles by the eyelashes and the mechanism of nictitation, certainly small elements such as bacteria must enter frequently. The bacteria may gain access in small droplets, through the medium of hands, by fomites, or may be carried from the lower lid into the conjunctival sac by nictitation as shown by a previous report.<sup>1</sup> Seldom, if ever, is the conjunctival sac sterile and yet pathology of the conjunctiva is rare in proportion to the apparent opportunities for bacterial invasion. It is the purpose of this paper to show the results of a study of the rate of disappearance of bacteria from the normal eyelids and the normal conjunctiva under varying conditions, and to discuss the factors that may be responsible for this phenomenon.

Stort in 1891<sup>2</sup> using *B. coli*, instilled one drop of a heavy suspension of this organism into the rabbit conjunctiva, and, making cultures from the conjunctiva on gelatin plates at 1, 5, 15, 30, and 60 minutes, studied the rate of disappearance of this organism. His results showed that the most rapid decrease occurred between 15 and 30 minutes. From 30 to 60 minutes there was a more gradual decrease until at the end of 60 minutes few, if any, organisms could be re-

covered. In our experiments rabbits and one human were employed.

*Experiment 1.* This experiment was designed to study the rate of disappearance of bacteria from the normal eyelid and was performed on a human volunteer. A one millimeter loopful of a 24 hour agar slant of *B. prodigiosus* was suspended in 5 cc. of normal saline. An area approximately one quarter by one inch on the upper and lower lids of both the right and left eyes was seeded from this suspension. Cultures were made from these areas every five minutes

the human, and the test organisms for the rabbit were *B. typhosus*, *B. coli*, streptococcus hemolyticus, pneumococcus type III, *B. proteus*, *B. dysenteriae shiga*, *B. prodigiosus*, *B. subtilis*, and an unknown bacillus probably a saprophyte. Suspensions were made as described above and in each case two drops of the suspension were dropped in the conjunctival sac. Sterile cotton swabs moistened with sterile normal saline were employed for recovery of the organisms. In the human the upper and lower palpebral conjunctivae were cultured, but in the rabbit only the



up to and including 60 minutes using sterile cotton swabs  $\frac{1}{8}$  by  $\frac{3}{8}$  inches moistened with normal saline. Plain agar plates were employed for culture and were inoculated by evenly rotating the cotton swab over the surface. The plates were incubated for twenty-four hours and were then allowed to stand overnight at room temperature to enhance pigmentation. The number of colonies were determined by direct count. The results are seen in Chart 1, which is an average of upper and lower lids of the right and left eyes.

*Experiment 2.* This experiment purposed observation on the rate of disappearance of bacteria both from the human and rabbit conjunctiva. *Bacillus prodigiosus* was the test organism for

lower palpebral conjunctivae were used, because we had found by previous experience that whereas the bacteria are more disseminated in the eye of the human, in the rabbit the greatest concentration is on the lower palpebral conjunctiva. The technique of culture was as described in Experiment 1, except that blood agar was employed for those organisms more fastidious in their nutritional requirements. Chart II shows the average result of right and left eyes in the human, and Chart III shows the average of right and left eyes in nine different rabbits employing nine different test organisms.

*Experiment 3.* This experiment was devised to see whether increasing the flow of tears would materially influence the rate of disappearance.



Two rabbits were employed, one weighing 3.7 Kg and the other 2.7 Kg. The marginal vein of the ear was employed in the intravenous administration of one milligram of pilocarpine per kilo of body weight. Five minutes later *B. prodigiosus* was introduced into the right and left eye of each rabbit as in experiment 2 and cultures were made every five minutes up to and including sixty minutes employing the aforementioned technique. The average results are seen in Chart IV.

*Experiment 4.* The purpose of this experiment was to see whether decreasing the flow of tears would influence the rate of disappearance. The same rabbits were employed as in Experiment 3, but were not made use of until one week after the completion of Experiment 3. Atropine was administered intravenously allowing 0.5 milligrams per kilo. *B. prodigiosus* was employed as the test organism and cultures were made as above. The results are seen in Chart V which is an average of right and left eyes in both rabbits.

*Experiment 5.* In this experiment observations were made to see whether diverting the lacrimal secretions from their normal pathway would influence the rate of disappearance. Under ether anesthesia a probe was introduced into the lacrimal duct. Using a small non-cutting curved needle and intestinal linen, a stitch was taken under the probe and medial to the opening of the duct. While gradually withdrawing the probe, the ligature was tied tightly without cutting into the tissue. The right eyes of both rabbits were treated in this manner. Examination at the end of 48 hours showing no existing inflammation; the rate of disappearance of *B. prodigiosus* was studied as previously. An additional study was also made on the subsequent day. Nasal cultures were made with each experiment to determine whether any organisms were passing through the duct, and these cultures were negative. The average results of these two experiments are seen in Chart VI.

*Discussion.*—The rate of disappearance of bacteria from the eyelids is in accordance with the report of Arnold, Gustafson, Hull, Montgomery and Singer<sup>3</sup> who found that the normal skin disinfects itself of 99-100% of applied test organisms in thirty minutes. Johnson and Arnold<sup>5</sup>

have shown that in an acid stomach viable organisms are rendered non-viable. Since the skin surface exhibits an acid reaction of Ph 5 to 5.7 Arnold and Singer<sup>5</sup> suggested that possibly the disinfecting mechanism of the skin might be related also to the existing acidity.

The graphs relating to the rate of disappearance of bacteria from the conjunctiva seem to be quite similar in spite of the fact that in specified instances the local physiology was altered. In every instance 99-100% of the test organisms have disappeared in from twenty to thirty minutes. This disappearance can not be explained on the basis of acidity as in the case of the skin inasmuch as we have found the Ph of conjunctival fluids to be between 6.2 and 6.6 using the La Motte method.

That a mechanical factor exists in the removal of foreign elements from the conjunctiva, whether they be bacterial or otherwise, can not be questioned. Maxey<sup>6</sup> recovered *B. prodigiosus* from the human nose five minutes after its introduction into the human conjunctival sac. We have recovered large numbers of *B. prodigiosus* from the rabbit nose one minute after its introduction into the rabbit conjunctiva. Just when the mechanical factor plays its most important role after the introduction of foreign elements such as bacteria into the eye, is, of course, problematical, but it would seem that this maximum effect is early, probably the first five minutes. The mechanical cleansing of the conjunctiva seems to be more efficient in the human judging from graph II, and this would be expected inasmuch as the nictitating mechanism in the human is active and in the rabbit it is quite inactive. The similarity of curves III, IV and V brings up the question of how great a flow of tears is necessary to maintain the normal lubricating and cleansing state in the conjunctiva. It would seem that this may be rather small if we may judge by the fact that in the presence of the atropine reaction the efficiency is as good as normal or when the flow of tears is increased by the use of pilocarpine. Certainly, it would be reasonable to assume that there is a maximum rate of flow of tears through the lacrimal apparatus and when this point is reached, there will be a backing up of the excess tears and the contained elements. When there is a sufficient excess the tears will flow over the mucocutaneous

border on to the lids and face. Increasing the flow of lacrimal fluids, therefore, does not necessarily promote better mechanical removal of foreign elements and possibly may reseed conjunctival surfaces with bacteria due to existing reverse currents contrary to the direction of normal tear flow. In Graph VI, however, obstruction of the normal exit of conjunctival fluids so that the only outward flow was over the lid borders, an equally efficient removal mechanism is evident. This would suggest that there is an additional factor other than the mechanical one.

That conjunctival fluids contain at least one bacteriolytic agent has been amply shown by Alexander Fleming.<sup>7</sup> He termed this lytic agent "lysozyme" and demonstrated that while it is most specific for *Micrococcus lysodeikticus*, it is also definitely inhibitory for a variety of pathogenic and non-pathogenic bacteria. Ridley<sup>8</sup> showed that there was a reduction in titre of lysozyme in the presence of acute inflammation, but not in the presence of chronic inflammation. Findley<sup>9</sup> reported a reduction in lysozyme content of rabbit tears during a deficiency diet. James<sup>10</sup> has shown that in the presence of acute corneal lesions the lysozyme titre is reduced. The fact that such a lytic agent exists which can act efficiently in high dilution would probably most satisfactorily explain the similarity of the curves showing the rate of disappearance of bacteria from the conjunctiva inasmuch as, while definite attempts were made to vary the mechanical factor, the lysozyme factors was not interfered with.

#### CONCLUSIONS

1. The skin of the eyelids disinfects itself of 99-100% of the applied test organisms in from twenty to thirty minutes. This phenomenon may be due to the acid reaction of the skin.

2. Although thousands of bacteria may be introduced into the conjunctival sac, 99-100% will have disappeared in from twenty to thirty minutes. This occurrence is probably due in part to mechanical removal and in part to the bacteriolytic quality of conjunctival fluids.

3. This property of the eyelid and conjunctiva serves as a defense mechanism against bacterial invasion.

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## CALCINOSIS CUTIS WITH HETERO- TOPIC BONE FORMATION

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Calcification in the skin continues to be a medical curiosity, even though case reports have been multiplying during the past few years. Still more unusual is the formation of heterotopic bone tissue in the skin or subcutaneous tissues; only a few cases have been described. I wish to report a case of calcinosis cutis circumscripta in which bone tissue developed in the skin on the basis of calcium deposits and to discuss the manner in which such changes develop.

The most common form of calcification in the skin (including subcutis) occurs in calcinosis cutis. Other terms employed to designate the same condition are lime gout, petrification of the skin, gout stones, hypodermolithiasis, granular deposits of lime, and calcareous subcutaneous concretions. Two types are usually described: calcinosis circumscripta and calcinosis universalis. My case belongs to the first group which is characterized by the development of circumscribed small, hard nodules of calcium salts. The nodules gradually grow larger and may rupture through the thinned out overlying skin and discharge calcareous masses, after which healing of the single lesions usually follows. The site of predilection is in the finger tips, about the small joints of the hands, or around the elbow or knee. The trunk and larger joints are rarely affected, although in my case the lateral portions of the buttocks were involved. Calcinosis circumscripta may occur idiopathically; in inflammatory lesions of long duration; secondary to fat necrosis; after trauma (Pellegrini-Stieda's lesion,<sup>1</sup> subacromial bursitis, ruptured tendons, etc.); and in thrombosis of veins and arteries.

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According to Tate and Trumper<sup>2</sup>, the deposits in calcinosis universalis occur as large plaques and masses in the skin and subcutaneous tissues, frequently in the connective tissues of fascia, muscle sheaths and muscles; it may involve the vascular system. Severe ulcerations, often secondarily infected after disintegration of the masses, is not uncommon. These cases may terminate fatally. In calcinosis universalis the calcium is believed to be of metastatic origin, associated with liberation of excessive amounts of calcium in the blood due to bone destruction. When no bone destruction is demonstrable, the term "metabolic" calcinosis has been applied. The blood chemistry as gathered from the literature by Maloney and Bloom<sup>3</sup> is not greatly significant. About fifteen authors report blood calcium values of 8.4 to 12.0 mgm. per 100 c.c.; phosphorus, 3.0 to 6.35 mgm.; two cholesterols were normal. In my case the findings were calcium, 11.5 mgm.; phosphorus, 4.5 mgm.; and phosphatase, 10.3 units; these may be considered as high normal values.

The composition of the deposits consists of large amounts of tricalcium phosphate, a trace of chlorides and a small amount of carbonates and inorganic material.<sup>3</sup> Calcium phosphate constitutes 19.29 to 90.0% of inorganic material; calcium carbonate, 3.0 to 10.0%.

*Etiology.*—The multiplicity of factors which have been named as the cause of calcinosis indicates that the etiology is still obscure and indefinite. The frequency with which scleroderma and Raynaud's disease are associated with calcinosis circumscripta involving the fingers has fostered the idea of a circulatory insufficiency as the underlying cause. Endocrine dysfunction has been suggested by Davis and Warren<sup>4</sup> who reported two cases occurring in elderly diabetic women. Dawson and Struthers<sup>5</sup> reported a case of generalized osteitis fibrosa with parathyroid adenoma and metastatic calcification in all organs and tissues in the body. Davis and Warren<sup>4</sup> believe that renal disease may alter the calcium metabolism. Epstein and co-workers<sup>6</sup> observed quite pertinently that uncomplicated calcinosis is rare. Scleroderma, arthritis, dermatomyositis, myositis fibrosa, osteomyelitis, chronic nephritis, Raynaud's disease and arteriosclerosis, named in the order of frequency, occur in combination with calcinosis.

Many authors favor the theory of faulty nutrition due to impaired peripheral circulation. H. Davis<sup>7</sup> noted certain common features about calcium deposits in Raynaud's disease. They occurred in women whose peripheral vessels were susceptible to cold; deposits usually involved the acra, which were the coldest areas; he noted no disturbance of calcium metabolism. Barr<sup>8</sup> observed calcinosis as a condition frequently associated with scleroderma; he stated that abnormal calcification depended on diminished blood supply. Weisenbach, Basch and Basch<sup>9</sup> reported circulatory injury with capillary disorders in all of their cases. Durham<sup>10</sup> noted enlargement of capillaries with bulb-like distension of the venous ends; blood flow was sluggish; after injection of adrenalin almost complete stasis resulted in the smaller capillaries and a marked decrease of speed in the larger ones.

Although Barr<sup>8</sup>, Thannhauser<sup>11</sup>, H. Davis<sup>7</sup> and others agree that a generalized disturbance of calcium metabolism is unlikely, and although they emphasize the idea that the process of calcinosis is an expression of a locally damaged tissue, a dystrophic calcification, certain systemic factors may also favor the local deposition of calcium (Wilson<sup>12</sup>). Rabl and Kleinmann<sup>13</sup> found that disturbance of the acid-base equilibrium caused a marked change in the renal excretion of calcium and phosphorus, although the bowel output was but slightly altered. Wilson<sup>12</sup>, however, in a single case was unable to produce any effect by alkalinizing the patient or placing her on a high protein, acid-forming diet. In this particular case the unusually high cholesterol (470 mgm. per 100 c.c.) in the blood stream may have produced an "endogenous hypervitaminosis D" which could cause the calcium to deposit in the soft tissues of the abused finger tips.

*Pathology.* Pathogenesis—Tissue damage or degeneration is the underlying process which predisposes to calcification. The affinity of damaged tissues for lime salts is well known. Calcification is often seen in tendons, ligaments and bursae following trauma; in inflammatory disease of long standing; in pressure necrosis of certain tumors or granulomata. Calcification of caseous tuberculous foci, even in bone<sup>14</sup>, needs only to be mentioned as another example.

Davis and Warren state that calcification never occurs in normal tissue except in the formation of bone. However, even in the enchondral line of the epiphyseal plate the deposition of calcium salts in the zone of calcification is dependent upon a certain form of degeneration of the deeper cartilaginous layers. I believe that calcification is physiologic to a certain degree, especially after the fourth decade of life, when degenerative changes in the body become more prominent.

The possibility of primary degenerative changes in the connective tissues enhancing calcium deposits is mentioned by Rudolph<sup>15</sup> and Tate and Trumper<sup>2</sup>. This idea may be tenable in cases of generalized calcinosis, but it is certainly an inadequate explanation for the localized form. Tate and Trumper believe that the lesions occur mainly where the subcutaneous fat is either small naturally or decreased due to disease such as scleroderma. This observation is generally true when the lesions occur in the finger tips or in the skin about the knee and elbow joints, or in the scrotum, but exceptions are conspicuous in such cases as mine where the gluteal region, rich in fat tissue, is involved. Epstein et al<sup>6</sup> mention that a disturbance of the fat metabolism of the epidermal cells is followed by secondary deposition of lime salts. McGowan<sup>16</sup> believes that all calcification is based on necrobiotic changes in which phospholipins are broken up. The phosphoric acid thus set free is neutralized by the blood calcium and deposited as calcium phosphate. Iron in the tissues may have some influence as in the organization of a hematoma.<sup>4</sup>

Returning again to the idea of deficient circulation, the role of concomitant edema becomes significant. Rudolph<sup>15</sup> described a case of dermatomyositis associated with calcinosis universalis in which he observed edema of the extremities. As the edema subsided calcification and improvement of symptoms appeared. Turpin, Brun and Guillaumin<sup>17</sup> also noted acute edema as the first phase, followed by hemorrhagic infiltration, sclerosis and calcification. They felt that the study of the acute phase of generalized edematous scleroderma of infancy, of dermatomyositis, and of ossifying polymyositis might eventually clarify the meaning of secondary calcinosis. Freund<sup>18</sup> states that Des-

jerine and Ceillier paid a great deal of attention to chronic and diffuse edema occurring in paralyzed limbs showing soft tissue calcification and ossification. The edema commonly encountered is evidently due to paralysis of the vessel walls, consequent to loss of vasomotor control. The transudation into the tissues and joints, periodically exacerbated, may best be compared with an angioneurotic edema, which also is fleeting in character. Nevertheless, Freund continues, the mechanic irritation of tissue by edema may be the etiology of soft tissue calcification and ossification. The acute transudation causes injury by microscopic tears with small hemorrhagic points in collagenous fibers. For a time the loose construction of the subcutaneous tissues permits the accumulation of relatively large amounts of fluid, but if the transudative tension is severe, the collagenous fibers, especially in the connective tissue stroma and in the fascial layers, become stretched beyond the limits of their elasticity and micro-tears and ruptures ensue.

Histopathology.—Epstein et al<sup>6</sup> state that the calcium is deposited in the swollen collagenous fibers, indicating that the pathology is a disturbance of the collagenous material, probably physiochemical. The areas of calcium deposition tend to be acellular. Interstitial deposits have been noted affecting children<sup>4</sup>, but are said to be rare. On the other hand, Tate and Trumper<sup>2</sup> found sharply defined masses of calcium salts deposited in spaces between collagen bundles of the dermis and occasionally in the subcutaneous fat. Sometimes a definite zone of inflammatory reaction showing giant cells surrounds the calcified focus. In larger lesions the surrounding connective tissue is condensed to form a fairly definite fibrous capsule.

In specimens from my patient several areas of amorphous calcium deposits were found, included in slightly fibrotic subcutaneous fat tissue (Fig. 1). The calcium salts occupied extensive areas uniformly or were concentrated as granular bodies into smaller foci, which were encapsulated by a dense fibrous tissue or surrounded by a mature granulation tissue whose phagocytic elements resorbed the calcium salts. As a result of this process of resorption the calcified area becomes split up by the invading fibrous tissue, so that in time the calcium salts



seem to have a diffuse distribution within fibrous tissue. (Fig. 3.)

The process of calcification may predispose to bone formation in any tissue, and the skin is no exception. Epstein<sup>6</sup> found bone transformation as an advanced stage of calcification by feeble direct metaplasia with several small vacuolated areas frequently containing two nuclei, but without any sign of cartilage formation. Turpin, Brun and Guillaumin<sup>17</sup> believed that the proximity of zones of hemorrhagic infiltra-

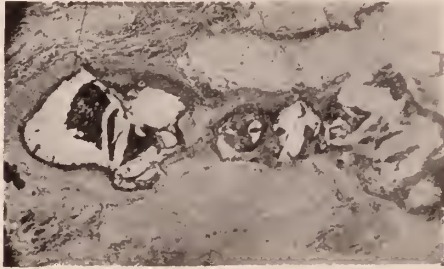


Fig. 1. A small group of calcified nodules is included within rather fibrotic subcutaneous fat tissue. A fairly definite fibrous tissue wall encapsulates the mass, merging into a rim of calcified fibrous tissue and primitive bone.

tion initiates the osteogenic process in collagenic, fibrosclerotic, cellulose-aponeurotic tissues containing calcium precipitations. Tissue removed by biopsy from one of the two diabetic patients reported by Davis and Warren<sup>4</sup> showed the presence of a small area of primitive bone matrix developing in relation to lime salt deposits.

In my case several areas showed irregular pieces of mature lamellar bone tissue in intimate

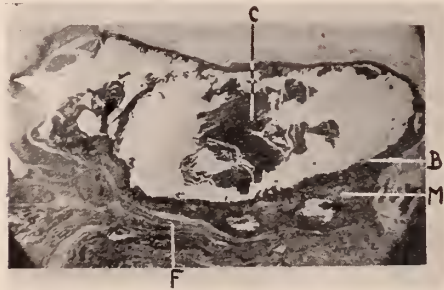


Fig. 2. A higher magnification of a calcified body shows the transition from fibrous tissue (F) to a calcified matrix with ground substance (M) to primitive bone (B). The central mass (C) probably represents calcified collagenous fibers. (See Fig. 5)

relation with the calcified areas, but always separated from them by a sharp lacunar outline. A typical area reveals a calcified body lying

in fibrous tissue. (Fig. 2.) The lower areolar subcutaneous tissue becomes more densely fibrotic and gradually merges into the fibrous tissue forming the capsule which envelopes the mass. At the periphery, the denser fibrous tissue is definitely hyalinized and may contain numerous granular or amorphous calcified deposits. Proceeding more deeply into the calcified body, the capsule loses its fibrillar structure as it becomes invested with a ground substance or matrix, which may be well-calcified. (Fig. 3.)



Fig. 3. The encapsulating fibrous tissue (F) which is heavily invested with calcium deposits merges into a triangular transitional zone composed of calcified tissue undergoing metaplasia into bone (C). Within it a number of vacuoles or cell spaces appear containing the primitive osteocytes. Just beyond is a narrow strip of definite bone tissue (B), quite primitive in structure. The central dark mass is composed of an amorphous material, apparently impregnated with calcium salts (M).

In a few places vacuoles or cell spaces appear containing single, sometimes multiple nuclei. This may be considered as primitive fibrous bone

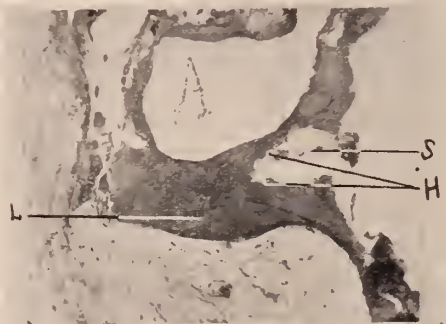


Fig. 4. The mature character of the heterotopic bone is apparent in the lamellar structure of the trabecula (L). A marrow space (S) contains vascular fibrous bone marrow which resorbs the primitive bone along Howship's lacunae (H), preparatory to laying down the mature lamellar bone.

of a metaplastic type. Once the bone tissue has appeared, its maturity into lamellar bone is merely a matter of differentiation and bone

transformation by bone resorption and apposition. The sections studied illustrate these changes, including the presence of small marrow spaces filled with fibrous bone marrow. (Fig. 4.)

Within the rim of bone which now lines the calcified body is found an acellular mass without any particular attachment. (Figs. 2 and 4.) However, it is arranged in heavy parallel bands with occasional longitudinal fissures between them. Although exact tissual classification of dead material is difficult, the general appearance is that of hyalinized and calcified collagenous fibers. (Fig. 5.) The changes, therefore, may be interpreted as follows: first, for some reason or other, an area of collagenous tissue becomes necrotic and secondarily impregnated with cal-



Fig. 5. The magnified central mass seen in Fig. 2 is composed of parallel wavy bands of hyalinized material containing calcium deposits. Although acellular, the general formation strongly suggests the structural arrangement of collagenous fibers.

cium salts; second, fibrous tissue encapsulates the mass in the same manner that any foreign body is segregated; third, the afflux of a blood supply peripherally favors the process of reorganization; fourth, metaplastic changes occur so that a primitive bone tissue develops and matures; fifth, reorganization takes place from without inward by a cellular creeping substitution which resorbs the dead mass and replaces it with living matrix or bone; sixth, the central mass remains unchanged for the time being because the living elements have not yet invaded it.

*Treatment and Prognosis.* Treatment has been more or less empiric since the cause is indefinite. Ross<sup>21</sup> suggests sympathetic gangliectomy when the fingers are involved, in order to overcome the impaired peripheral circulation. On this basis, passive vascular exercises might

prove beneficial also. Heliotherapy and roentgenotherapy have been mentioned. In my case the patient was relieved of pain and tenderness by resection of the skin and subcutaneous tissue bearing the calcium deposits.

The fate of the calcified bodies varies. For the most part they may persist indefinitely. However, in certain areas where the skin is thin



Fig. 6. The positive print of the roentgenogram of the right hip and pelvis reveals a collection of calcified bodies lying lateral to the upper wing of the ilium. A number of phleboliths lie within the pelvis.

or atrophic the tendency is for extrusion. Hein<sup>19</sup> reported the disappearance of calcareous deposits in a 6½ year old child after use of heliotherapy and x-ray subsequently. However, the specific effect of light therapy is not proved, since Swanson, Forster and Iob<sup>20</sup> state that the deposits in the skin of a 6 weeks' old infant disappeared completely and spontaneously without treatment after six months. One can only conjecture as to the reason for these deposits in childhood; the metabolic activity of tissues in the young is so great as to make complete restitution quite possible once the underlying agents have been removed or readjusted.

*Comment.* The significant feature underlying all forms of calcinosis circumscripta is degeneration of tissue. It is, therefore, unwise to specify any given single factor as the causative agent for all types. Vascular disturbances, trophoneurotic sequelae, trauma, physiologic changes compatible with advancing age, or



mechanical stresses from tension or pressure may result in tissue damage. In instances of isolated lesions, local tissue catabolism may predispose to calcification. This is probably true in later life, when tissue turgor and elasticity decrease with wear and tear. The atrophic, redundant, atonic, senile skin of my patient suggests this likelihood. As the tissue degenerates, certain biochemical changes occur which favor the deposition of lime salts. Bone formation is merely an interesting variant of the calcifying process.

#### CASE REPORT.

*Past history:* The patient, O. McC., a white female, was first seen on May 18, 1933, at the age of 55 years. Her original complaint centered around an advanced, severe osteoarthritis of the left hip and an associated secondary lumbar scoliosis. A subtrochanteric osteotomy was performed. On January 2, 1934, a new complaint was noted: tender subcutaneous nodules over both hips, worse on the right.

*Local physical examination:* Numerous discrete, hard, split-pea to bean-sized nodules were found in the subcutaneous tissue over both hips, along the lateral wings of the ilii. They were more noticeable on the right side.

*Clinical laboratory:* The blood Wassermann was negative. High normal values were given for calcium (11.5 mgm.) and phosphorus (4.5 mgm.); phosphatase was normal (10.3 units).

Urine was negative chemically and microscopically.

*X-rays:* Anteroposterior studies of the pelvis on May 19, 1933, showed calcified deposits in the soft tissues above the right hip. There is complete resorption of the neck of the femur, with extreme arthritic changes. The joint space is obliterated almost completely. On April 4, 1935, an anteroposterior view of the right hip shows a number of calcified bodies concentrated in an area lateral to the iliac wing. Their structure is irregular, not concentric, and of varying density. Many intrapelvic phleboliths are seen. (Fig. 6)

*Biopsy:* Operation performed on April 8, 1935. The redundant skin and subcutaneous tissues containing the calcified nodules were resected from over the right hip. A piece of tissue 4.5 x 3.0 x 0.3 cm. was removed, demarcated by deep fascia on its under surface. At the superficial surface, between the fatty lobules, a large number of white, hard, small and large, bean-shaped nodules is lying in the fibrous tissue septa. Their surfaces are smooth, covered by thin layers of fibrous tissue.

*Pathologic diagnosis:* Calcinosis cutis circumscripta with heterotopic bone formation (see preceding text under histopathology).

*Progress note:* On April 14, 1935, the arthritic pain in the left hip still persisted. Numerous small, pea-sized, hard nodules were present over the right greater trochanter, but were symptomless. No pain or tenderness was elicited in the healed operative area

on the right side, from which the dermoliths were resected.

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### RECTAL FISTULA COMPLICATED HORSESHOE TYPE

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*Introduction:* It has been repeatedly mentioned that fistulae of the rectum are difficult to cure and that many of these cases do not heal properly and invariably require a second operation. Various reasons are given and the criteria are well established. It is equally true that many of these rectal fistulae appear for care much too late for adequate consideration.

I wish to tell you a story of a very interesting case of a horseshoe fistula (complicated) in which I became entangled some three years ago.

The case was that of a woman about 40

years of age, unmarried, who presented herself for care because she simply could not go on any longer. For some unforeseen reason huge bilateral ischiorectal abscesses developed involving practically the entire buttock on each side. Her family physician advised her properly but she did not heed his advice and waited until the abscesses on each buttock pointed and a foul and profuse discharge became evident. When she appeared for care we localized the inflamed areas and established "free drainage." About a week later—

*Proctoscopic Examination* revealed a horseshoe fistula with two possible external tracts (external to the bowel) and two internal openings. The two internal openings comprised the one usually found posteriorly and one additional opening into the bowel on the left side at about 9 o'clock (knee-chest posture) also draining to the exterior. We explained to the patient the necessity of operating in several stages and carefully planned the procedure in three parts.

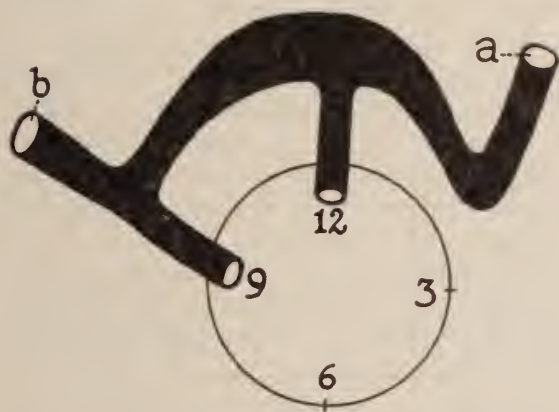


Fig. 1. Diagram showing the rectum represented by a circle in proctoscopic position (knee-chest) with two external tracts (a and b) and two internal openings—one at 9 o'clock (L. side) and one at 12 o'clock posteriorly.

*Operation. 1st Stage:* The external tract of the left side of the bowel was laid open and allowed to heal. The patient was permitted to leave the hospital for two weeks and then to return for the second stage.

*2nd Stage:* At this time the internal tract on the left side at 9 o'clock was laid open and the external sphincter was cut at an angle and the fistulous tract resected. The sphincter was not repaired. The tract was kept clean and granulation tissue was built up in such manner so as

not to allow any retraction of the edges of the fistulous tract: it is essential to bring the edges of the sphincter to close proximity. The patient made rapid progress discounting the usual difficulties of keeping the tract from healing and closing too rapidly.

The patient returned to us about three weeks later ready for the final stage.

*3rd Stage:* At this period we directed our attention toward the internal opening posteriorly in the midline (12 o'clock) (knee-chest posture). As you probably know, the posterior fistula almost always necessitates cutting the sphincter in addition to opening and draining the tract widely. At this time instead of depending on scar healing to build up the sphincter, we carefully repaired the sphincter and then systematically built up the scar immediate to it. It is very essential to keep the wound as clean as possible at this final stage and to keep the sphincter at rest long enough to have built up sufficient reinforcement for proper function later. The patient made an uneventful recovery and walked out of the hospital having one or two stools daily. No signs of incontinence was noted at any time up to the present.

*Remarks:* Apparently just to add more fuel to the fire while under our care the patient had developed, during the three year period, a huge fibroid uterus; about nine months later I performed a hysterectomy. I saw the patient again on August 10, 1926. She stated that she has an average of two normal bowel movements daily, has no pain or discomfort and displays no evidence of any disfunction of the rectal sphincter.

*Discussion:* One of the most interesting phases of this rectal disease is the fact that fistulae in general are not encountered as frequently now as in the past and that complicated horseshoe fistulae in particular are very infrequent. The English statistics on this entity show a gradual decrease of incidence of rectal fistulae from a ratio of 4 to 1 to a ratio of 10 to 1. Further analysis shows a more marked decrease of ratio of complicated fistulae as compared with simple fistulae. This analogy is logical from statistics just mentioned. It is apparent that better care and early treatment are mainly responsible for the improvement. Over a period of years I have observed 186 cases of rectal fistulae selected from 6,523 proctoscopic



examinations. Of the 186 cases of rectal fistulae only 21 were horseshoe in type and only 12 of the 21 were complicated.

The question of rectal incontinence has interested many proctologists and has kept an equal number in constant fear. In the past we were taught that the internal sphincter as well as the external sphincter were injured in cases of rectal incontinence; and while I feel fairly confident now that essentially it is the external sphincter injury that is mainly responsible for rectal incontinence I continue my regard for the internal sphincter. Some years ago we experimented in this direction on a group of dogs and the results are rather convincing.

The external sphincter is contracted involuntarily while relaxation is produced voluntarily. In this respect it compares with the sphincter of the urinary bladder only. The internal sphincter on the other hand is not controlled voluntarily at all.

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I wish to thank Dr. B. Sladek for referring this case and for his cooperation in the post-operative care.

## SKIN MANIFESTATIONS OF DRUG INTOXICATIONS

### *Dermatitis Medicamentosa*

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The dermatological approach to the patient exhibiting either a circumscribed or generalized cutaneous eruption should proceed in an ordered sequence of thought. This is automatically followed by the trained observer and, if consciously applied, will increase the diagnostic accuracy of the physician who is only occasionally confronted with a skin problem. The diagnosis depends chiefly on objective symptoms which are considered as follows:

1. Is the eruption produced by external or internal factors?
2. If internal, are the skin lesions a disease entity in themselves or are they a symptomatic manifestation of some underlying process?
3. If symptomatic, do they belong to the

acute exanthemata group or are they the evidence of underlying toxicity?

4. If toxic, are they associated with visceral disease or produced by focal infections, gastrointestinal food sensitivity and poisoning or skin manifestations of drug intoxications?

Whether a dermatitis is caused by external or internal factors can usually be determined by the appearance, variety and location of its component lesions. If external, the lesions appear to be on the surface of the skin; if internal, they are in the skin. The contact dermatoses, occupational dermatoses, eczemas produced by chronic irritations, etc., listed under the group of dermatitis venenata consist primarily of redness due to irritation and trauma, vesicles, papules and squamous lesions in circumscribed areas located most frequently on the exposed surfaces. Skin manifestations of internal toxicities are, in general, not sharply margined, show no preference for exposed surfaces and primarily are erythematous eruptions manifestly due to disturbances in the cutaneous capillary system. The atypical character of toxic eruptions distinguishes them from disease entities as, for example, pityriasis rosea, lichen planus, disseminated lupus erythematosus, etc., which are diagnosed either by a photographic impression of each disease in its entity or by an analytical compilation of the primary and secondary lesions composing the disease.

The majority of drug eruptions belong to the erythematous type of lesions and must be distinguished from the acute exanthemata, chiefly scarlet fever and measles. In drug rashes, as a rule, there is no elevated temperature and though there may occasionally be slight sore throat, furred tongue, a trace of albumin in the urine and possibly some desquamation, the sequence of events is not that of an acute exanthem for there is not the same definite incubation period, the eruption comes out more suddenly and violently and generally disappears when the drug is stopped. In drug eruptions the patient is generally not toxic, considering the extent and severity of the eruption, and usually presents very few subjective symptoms.

It is extremely difficult, at times, to differentiate drug eruptions from toxic eruptions due to other causes as the skin picture is that of sensitivity with no specific characteristics indicat-

ing bacteria, food or drugs as causative agents. After the diagnosis of toxic eruption has been made, a detailed history and careful physical examination, when indicated, is required to place the condition in its proper nosological classification.

With a few exceptions, drugs produce non-characteristic dermatoses which may be erythematous, erythematopapular, urticarial, vesicular and bullous. The type of eruption in each individual case is usually uniform but, as with quinine, may be multiform. The same drug may produce different types of eruptions in different individuals. Individual susceptibility to a drug is usually necessary to cause an eruption and this susceptibility may be hereditary. More frequently the eruption follows the phenomenon of anaphylaxis.

*Arsenic.* Arsenic is one of the most common causes of drug eruptions and may follow medicinal therapy or result from ingestion and absorption of even minute quantities in food, the arts and industry. Fortunately, arsenic, chiefly in the form of Fowler's solution or the solution of potassium arsenite, is no longer considered a panacea for all cutaneous eruptions and its diminishing empirical use is reducing the incidence of arsenical intoxications. It is important, as with all drugs, to know the early symptoms of arsenical poisoning and to immediately discontinue its use. A resume of the cutaneous arsenical reactions which may occur in the treatment of syphilis will also summarize its toxic symptoms in whatever manner administered.

Therapeutic shock or the Jarisch-Herxheimer reaction is produced chiefly by the arsphenamines in the treatment of syphilis and consists of a flare-up of manifestations of the disease following a large initial dose. It is due to an irritative reaction to an increased liberation of toxins by still living spirochetes or to protein decomposition products and endotoxins resulting from their destruction. The reaction occurs eight to twelve hours following the injection and may be accompanied by fever.

The nitritoid crisis is an acute vascular reaction to the arsphenamines and is an expression of idiosyncrasy or hypersensitivity. It has a superficial resemblance to the reaction produced by amyl nitrite and, at the time of injection or within five or ten minutes, is indicated by a dif-

fuse erythema or suffusion, acute edema, laryngeal stridor and loss of consciousness. The patient's entire arm should be observed while injecting neoarsphenamine with any increased redness of the skin an immediate sign to discontinue the injection.

The ninth day erythema is a morbilliform and scarlatiniform erythema closely resembling measles and scarlet fever which appears eight to nine days following the first injection of neoarsphenamine. It is attributed to the impaired elimination and retention of the phenol portion of the arsphenamine molecule.

The non-specific cutaneous reactions to arsenic may be the result of acute intoxication due to one or more large doses or to smaller doses in a highly susceptible individual and of chronic intoxication for small doses over a prolonged period. The onset of either is usually initiated by pruritus, particularly of the trunk, palms and soles, and the patient should be questioned repeatedly regarding increased itching. The skin becomes roughened and an erythematous rash, usually commencing on the lateral surfaces of the trunk, may become generalized. It is not uniform and is accompanied by redness, pain and swelling of the palms and soles, edema of the eyelids and results in fine desquamation or an acute exfoliative dermatitis. Rarely the eruption may be vesicular, bullous, pustular and even gangrenous.

The skin lesions following chronic arsenical poisoning may be erythematous, keratotic especially of the palms and soles, pigmentary and may produce hyperidrosis, disorders of the nails and herpes zoster. Occasionally epitheliomata follow arsenical intoxication and are usually added to the hyperkeratosis. Arsenical pigmentation is a characteristic symptom occurring in patches appearing as reticular mottling due to enclosed areas of normal white skin. It also tends to darken normally pigmented areas. The skin is dry, harsh and of increased thickness.

Chronic arsenical poisoning due to contacts from food, the arts and industry is becoming increasingly important and, in many instances, is the explanation for "eczemas" of eight, ten or more years duration.

*Quinine and Quinine Derivatives.* Quinine is a frequent and, because of its wide use, an important producer of intoxications. Its common-



est type of eruption is a scarlatiform erythema which disappears on pressure. Urticaria, papules, vesicles, bullae, petechiae and other purpuric lesions occur. At times there may be a desquamation resembling that seen following scarlet fever. The lesions sometimes persist for weeks and months and can be exacerbated by emotional excitement, fright, etc.

Patients generally are well aware of their idiosyncrasy to quinine as contact with hair tonics, shampoos, cough mixtures, etc., even in minute amounts produce their symptoms. It is important for physicians to question all patients before administering quinine in any form.

Symptoms produced by cinchona and cinchona alkaloids resemble those following quinine. Cinchophen and cinchophen derivatives, which are also known by their proprietary names of "atophan" and "novatophen," in addition to producing erythematous, urticarial and acute exfoliating skin eruptions, are frequently extremely toxic in small doses given for very brief periods with fatal termination in approximately one-half the cases reported. Several patented medicines contain cinchophen and deaths have been reported following their use.

*Bromides.* Bromides are one of the few drugs which produce characteristic eruptions known as bromadermas. They may appear after one or two large doses or after the drug has been used over a prolonged period and are apt to persist a considerable period of time after it has been discontinued. The most common type of bromide eruption, the bromacne, consists of papular and pustular acne-like lesions located over the face, chest, shoulders and legs. Another variety consists of peculiar raised, crusted, granulomatous masses, variously sized, rounded or irregularly outlined lesions, reddish-brown in color and studded with minute pustular points. Bromides have been prescribed by the unwary physician to relieve the discomfort and pain from the granulomatous lesions produced by this drug with the establishment of a vicious circle. Non-characteristic eruptions as a vesicular rash simulating chickenpox, urticaria, bullae, furuncles and carbuncle-like lesions also occur as a manifestation of bromide toxicity.

*Iodides.* The iodides are a frequent cause of drug eruptions due to their common use and because a large number of individuals are hyper-

sensitive to them. The lesions closely resemble those produced by the bromides with the most common acneiform or furuncular in type involving the face, neck and shoulders. Nodular lesions may suggest syphilitic gummata and, if potassium iodide is being administered, its dosage may be increased with an aggravation of the eruptions. Vesicular and bullous lesions, which are peculiar to the iodides, are situated on erythematous bases and present dark centers resembling smallpox. These are usually situated on the face, neck and hands and, when the ruptured bullae are replaced by soft vegetating lesions, they may resemble pamphigus vegetans. The mucous membranes may be involved with vesicular and condylomatous lesions or excoriations over the tongue, palate, fauces and gastrointestinal tract. If the eruptions are extensive, they are usually associated with other symptoms of iodism as coryza, pharyngeal catarrh, gastrointestinal irritation and sometimes marked rise in temperature.

*Barbital and Barbital Compounds.* Barbital and its compounds may produce generalized erythematous or local fixed eruptions. The generalized eruptions are usually morbilliform and scarlatiniform in character with occasionally bullous and erosive lesions on the buccal mucosa and can be accompanied by fever. Medinal, alonal, phenobarbital, veronal, luminal, dial, ipral, amytal, nembutal, etc., are proprietary barbital compounds which are familiar products to the laity and should be considered in determining the source of toxic eruptions. Also, they should be prescribed with caution as sedatives and hypnotics for any acute dermatitis as they may increase or augment the eruption.

*Phenolphthalein.* The characteristic phenolphthalein eruption consists of erythematous plaques followed by pigmentation. These are termed fixed eruptions as the lesions occur in the same sites each time the drug is taken. Vesicles, erosions or superficial excoriations, when they occur, are usually located in the mouth or on the skin of the genitals. The promiscuous use of patented and proprietary laxatives should be discouraged as many contain phenolphthalein.

#### TREATMENT

After the diagnosis of a drug eruption has been established or suspected, the treatment is largely symptomatic. The causal drug must be

discontinued at once. Saline cathartics, alkaline diuretics and forced fluids should be instituted. Sodium thiosulfate in one gram doses intravenously followed by intravenous calcium medication, if indicated, is the recognized method for treating arsenical intoxications. The intravenous administration of large quantities of decinormal saline solution benefits iodide and bromide eruptions. Concomitant systemic disturbances as hepatitis, nephritis, etc., when they arise, are serious and usually require hospitalization and appropriate intensive medication.

Local medications are prescribed to increase the comfort of the patient and usually have no effect upon the subsidence of the eruption. They may consist of calamine and zinc lotion, applications of olive oil, dusting with powders, colloidal baths, etc. Continuous saline dressings benefit nodular and granulomatous lesions produced by iodides and bromides. The resistance of the skin to bacterial infections is usually lowered during and following these eruptions and suitable antiseptic washes, ointments and dressings should be instituted when indicated.

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#### DISCUSSION

J. M. McCuskey, Peoria, Illinois: Dr. Morginson has done well to call attention to the various eruptions that may be produced by the internal administration of drugs. His outline of the method of approach should be quite valuable to those who have not been accustomed to using such a method.

One cannot help but compare the various drug eruptions with those produced by syphilis. Many of the drug eruptions may closely resemble the various syphiloderms but they also possess other similarities. Both present a wide variety of cutaneous lesions and the lesions of both may very closely resemble a great number of dermatological conditions. For this reason it is always of the utmost importance for the physician when examining a patient with an eruption which is obviously of a systemic nature to consider the possibility that this eruption may be due to a hypersensitivity to drugs or to syphilis. The failure to recognize both conditions is often due to the fact that the physician did not think of them.

Of course in a short paper it is possible only to mention a few of the more important phases and to consider only the eruptions produced by the more commonly used drugs. There are a few points that Dr. Morginson did not have time to mention that might be of some practical importance. When attempting to obtain a history of drug ingestion, it is not always sufficient to ask the patient if he has been taking medicine. A question, "Have you been taking any medicine?" may evoke a negative response but if the

patient is asked if he has been taking a laxative, a sedative or a tonic, etc., a history of drug ingestion may sometimes be obtained. Again it is possible that a patient may have a drug eruption and may not have taken medicine in any form. Dr. Morginson has mentioned that arsenic eruptions may be produced from arsenic obtained from sources other than drugs. It is well known that nursing infants may develop eruptions from drugs, particularly bromides and iodides, taken by their mothers. Iododerma may be produced by the ingestion of iodized salt. The acne-form lesions not infrequently result from iodine obtained in this manner. Phenolphthalein is often present in some brands of tooth paste, in some mouth washes and in the pink frosting used on some cakes. Individuals sensitive to phenolphthalein may develop typical eruptions from the phenolphthalein obtained from these sources.

A patient may be sensitive to both the local application and to the internal administration of a drug. For example, if the internal administration of quinine will produce an eruption in an individual, this same individual may very likely develop a dermatitis if this drug is applied to the skin; for instance, incorporated in a hair tonic. I have seen two patients in whom the local application of quinine produced a dermatitis venenata and the internal administration a dermatitis medicamentosa. Individuals who are sensitive to drugs will almost never develop a positive reaction to the patch test with the notable exception that patch tests may be positive when the drug eruption is of the eczematous type.

Lastly, when administering a drug to determine whether an eruption might be due to this drug, it is important to remember to give a very small dose, usually one that is much smaller than the therapeutic dose. Sometimes quite unfavorable reactions result from even therapeutic doses of a drug given to an individual who is hypersensitive to that drug.

#### SCOPOLAMINE AND ATROPINE CYCLOPLEGIA

##### *A Comparative Study*

LOUIS BOTHMAN, M. D.

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In 1932, I published a comparative study of the cycloplegic effect of homatropine and atropine<sup>1</sup>. This revealed that homatropine had many shortcomings and that atropine was a much preferable drug for use in refraction. Because the cycloplegic effect of atropine lasts for ten days or even longer in many cases, I decided

<sup>1</sup>Read before the Section on Eye, Ear, Nose and Throat, Eighty-sixth Annual Meeting, Illinois State Medical Society, Springfield, May, 20, 1936.

From the Division of Ophthalmology, Department of Surgery, The University of Chicago, Dr. E. V. L. Brown, Director.

1. Arch. of Ophth. 7: 389, March, 1932.



to use scopolamine, whose cycloplegic effect lasts from 60 to 72 hours and compare its value in refraction with atropine. The results of this study made on 237 eyes of 138 patients is presented.

In this series of 138 cases, there were 78 females and 58 males. Of the 237 eyes, 88 were myopic, 119 hyperopic and 30 had mixed astigmatism. These were divided into three age groups. A, contains all cases under 20 years of age; B, those between 20 and 40 years, and C, all over 40 years of age.

*Technic.* The material presented is taken from the private practice of Dr. E. V. L. Brown and myself, and from the Max Epstein Clinic of the University of Chicago.

The eyes were examined by retinoscopy in the usual manner, making the test from one meter distance using a concave mirror.

The scopolamine hydrobromide was used in 0.5% aqueous solution. Two drops were instilled into the conjunctival sacs at one-half hour intervals and the examination made 15 minutes after the second drop.

Atropine sulphate 1% in aqueous solution was used for 3½ days. The first drop was instilled before retiring on the fourth evening before the examination and repeated four times daily the succeeding three days and at breakfast and lunch time on the day of examination. Patients at the clinic had 14 drops in all and those seen at the office 15 drops.

In 8% of patients, there was a reaction to scopolamine as manifested by dizziness or a staggering gait. A dram of aromatic spirits of ammonia administered orally was sufficient to restore patients having a reaction to normal. Only occasional drowsiness persisted after an hour.

tion of the ciliary muscle under atropine. This represents 11.7% of all eyes in the series. It will be noted that these changes occurred in patients in groups A and B—all under 40 years of age. Only one eye in any patient over 40 years of age changed from mixed astigmatism to hyperopia.

In 44 of the 237 eyes there was no change in the power of either the sphere or cylinder. These were divided as follows: 14 myopes all in group B; 25 hyperopes 3 in group A, 18 in B and 4 in C; and 5 mixed astigmatism 1 in A, 2 each in B and C. In terms of percentage 14.7 had the same refractive errors when examined while under the influence of either drug.

There were 238 hyperopic meridians of which 148 had more hyperopia under atropine and 22 had less. Group A had 43 more and 5 less, B had 88 with more and 12 with less and group C had 17 with more and 5 with less hyperopia.

In other words 90.6% of the hyperopic meridians under atropine were stronger than while under scopolamine.

There were 176 myopic meridians in the series of which 92 were weaker while under atropine than when under the influence of scopolamine. In Group A, 24 were weaker; in B, 61 were weaker and 28 stronger (more minus) and in C, 7 were weaker while none were stronger. 87.2% of the myopic meridians were weaker under atropine.

There were 30 eyes with mixed astigmatism under scopolamine and atropine. Table 2 indicates the changes of the spheres and cylinders. Of these eyes 13 showed less sphere (myopia) and more cylinder (hyperopia) under atropine; 3 had less sphere under atropine while the cylinder remained the same. The myopic meridian was less in 76.4% of all mixed astigmatism eyes.

TABLE I. CHANGES IN TYPE OF REFRACTIVE ERRORS

Groups .....	Myopia to Emmetropia			Myopia to Mixed Astigmatism			Myopia to Hyperopia			Mixed Astigmatism to Hyperopia			Emmetropia to Hyperopia		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Number of Eyes.....	1	4	0	0	4	0	2	4	0	2	6	1	0	3	0
Total Number .....	5			4			6			9			3		
Per cent .....	4.4%			3.5%			5.4%			8.1%			2.7%		

*Data.* In Table I is presented the eyes in which there was a change in the type of refractive errors. In 24.3% of the myopic, emmetropic and mixed astigmatic eyes under scopolamine, there was a definite change due to better relaxa-

Table 2 also shows the changes in astigmatism in the hyperopic and myopic groups. In the myopic group the largest figure, 31 in column 9, is that in which less sphere was found with a higher cylinder while in the hyperopic group

columns 5, 6 and 7 are almost the same, i. e. the combination of higher spheres with either a higher or lower or the same cylinder was found with about equal frequency.

The axis of astigmatism was unchanged in 95 eyes (all groups). The change under atropine was less than 15° in 27 eyes and more than 15° in 75 eyes. This latter figure includes the eyes which changed from simple spheres to astigmatism under atropine.

Astigmatism with the rule was found in 76 of 97 hyperopic eyes under scopolamine and 76 of

spheres changed to myopic astigmatism while 8 remained simple spheres. In 6 others the refraction changed from a myopic astigmatism to a spherical correction.

Special note is made of the two eyes which changed from hyperopia to mixed astigmatism and the one from hyperopia to emmetropia. These were outstanding exceptions to the usual findings as were the 5 eyes which changed from mixed astigmatism under scopolamine to myopia under atropine.

Table 3 is almost self-explanatory. Attention

TABLE 2. CHANGES IN REFRACTION IN EACH EYE

Group		No. of Eyes	> S	< S	1 S	>S <Cyl	>S >Cyl	>S 1 Cyl	<S <Cyl	<S >Cyl	<S 1 Cyl	1 S >Cyl	1 S <Cyl	1 S 1 Cyl	1 Axis	< 15° Diff.	> 15° Diff.
Myopia	A.....	15	..	..	..	..	..	..	2	8	2	..	2	1	5	1	4
	B.....	68	2	2	5	3	3	..	4	21	9	4	6	9	14	10	18
	C.....	5	..	..	..	..	..	..	1	2	1	..	1	..	2	1	1
		88	2	2	5	3	3	0	7	31	12	4	9	10	21	12	23
Hyperopia	A.....	30	1	..	..	4	6	8	1	2	..	4	1	3	14	1	14
	B.....	73	4	..	1	18	13	11	..	7	..	4	2	13	32	7	27
	C.....	16	..	..	..	2	5	2	..	1	..	3	1	2	11	3	2
		119	5	..	1	24	24	21	1	10	..	11	4	18	57	11	43
Mixed Astigmatism	A....	4	..	..	..	..	..	..	..	2	0	..	..	2	2	1	1
	B....	17	..	..	..	1	1	0	2	8	3	..	..	2	10	2	5
	C....	9	..	..	..	2	1	..	0	3	0	..	1	2	5	1	3
		30	..	..	..	3	2	0	2	13	3	..	1	6	17	4	9
Grand Total .....		237	7	2	6	30	29	21	10	54	15	15	14	34	95	27	75
Total Myopia %...		..	2.4	2.4	6.1	3.7	3.7	0	3.7	22.2	9.8	4.9	11.1	12.3	25.9	14.8	28.2
Total Hyperopia % ..		..	4.2	0	0.8	19.3	19.3	17.6	0.8	8.4	0	9.2	3.3	15.1	47.8	9.2	36.1
S = sphere																	
Cyl = cylinder																	
> = more																	
< = less																	
1 = same																	

93 under atropine. In myopic eyes it occurred, 31 times in 62 eyes under scopolamine and 35 of 57 under atropine. In eyes with mixed astigmatism it was with the rule in 16 of 26 eyes with scopolamine and 15 of 26 under atropine. For the whole series, 123 times in 185 eyes, the astigmatism was with the rule with scopolamine and 126 times in 176 eyes with atropine.

In the hyperopic group simple spheres under scopolamine changed to hyperopic astigmatism (simple or compound) in 8 eyes and in 8 they remained simple spheres. In 12 eyes which had hyperopic astigmatism errors under scopolamine, the correction under atropine was found to be only spherical.

In the myopic group 13 eyes with simple

is called to the actual difference in diopters found in eyes under the two drugs. The totals show that the difference was only +0.25 diopter in 177 meridians; 0.50 diopter in 94 meridians, 0.75 diopter in 46 meridians and 1 or more diopters in 18 meridians. In only 5 cases was the difference more than 1 diopter. There were 2 in group A hyperopes and 3 in group B myopes. The greatest difference was 1.75 diopters. The average differences for the series in groups is given in diopters. The total was 0.41 diopters increase in hyperopia and mixed astigmatism and 0.43 diopters less in myopia.

*Summary.* 237 eyes were refracted while under the influence of scopolamine and again while under atropine and the figures compared.



*Myopia.* Four and four-tenths per cent, of all myopic eyes under scopolamine were emmetropic under atropine; 3.5% changed to mixed astigmatism and 5.4% became hyperopic.

Sixteen per cent of simple myopic eyes changed to myopic astigmatism and 9.7% remained simple myopia. In 7.4% the change was from myopic astigmatism to simple myopia.

Eighty-seven and two-tenths per cent of all myopic meridians had an average of 0.43 diopters less myopia under atropine. The dif-

ference was greater in the youngest age group. per cent of cases of mixed astigmatism under scopolamine were hyperopic under atropine.

Thirty-eight and two-tenths per cent had a weaker minus meridian and a stronger plus under atropine.

The minus meridian was weaker and the plus unchanged in 23.5%.

The minus meridian was weaker in 76.4% of all cases of mixed astigmatism.

Most changes occurred in the 20 to 40 age group.

TABLE 3. CHANGES IN MERIDIANS OF REFRACTION, GROUPS A, B AND C

Group	No. of Cases	No. of Eyes	Meridian		Atropine > Scopolamine		No Change		Atropine < Scopolamine		Difference					Astigmatism with Rule		Less Cyl.	More Cyl.	Same Cyl.
											+0.25	+0.50	+0.75	+1.00	Aver.	Scopolamine	Atropine			
Hyperopia																				
A .....	17	30	60	43	12	5	26	9	12	1	>.43	20/24	21/24	6	12	9				
B .....	50	73	146	88	46	12	52	28	16	4	>.46	46/57	45/53	19	21	24				
C .....	8	16	32	17	10	5	14	4	2	2	>.40	10/16	10/16	9	14	12				
Total .....	65	119	238	148	68	22	92	41	30	7	>.39	76/97	76/93	34	47	45				
Myopia																				
A .....	10	15	30	0	6	24	7	10	3	4	<.57	3/14	8/10	3	9	3				
B .....	37	68	136	28	40	61	46	32	9	7	<.41	27/44	26/43	15	26	17				
C .....	3	5	10	0	3	7	4	3	0	0	.35	1/4	1/4	2	2	1				
Total .....	50	88	176	28	49	92	57	45	12	11	<.43	31/62	35/57	20	37	21				
Mixed Astigmatism																				
A .....	3	4	8	6	2	0	3	2	1	0	>.40	3/4	2/4	0	3	1				
B .....	14	17	34	20	11	3	18	3	2	0	>.33	7/13	7/13	4	2	1				
C .....	6	9	18	0	7	11	7	3	1	0	>.18	6/9	6/9	5	0	4				
Total .....	23	30	60	26	20	14	28	8	4	0		16/26	15/26	9	5	6				
												>.41								
Grand Total ....												<.43	123/185	126/176	63	89	72			

ference was greater in the youngest age group.

Twenty-two and two-tenths per cent of all myopic eyes had a decrease in the sphere and an increase in the strength of the cylinder.

Every eighth meridian was decreased 0.75 or more diopters.

*Hyperopia.* Of 238 hyperopic meridians, 72% had an average increase of 0.39 diopters, the highest increase being an average of 0.46 diopters in the group between 20 and 40 years of age.

Of the 88 hyperopic eyes 28% had no change in the strength of either the sphere or cylinder.

Every sixth meridian had an increase of more than 0.75 diopter.

*Mixed Astigmatism.* Eight and one-tenth

CONCLUSIONS

Scopolamine cycloplegia is not as complete as that of atropine. The refractive errors found under scopolamine closely approximates those for atropine, the difference being an average of 0.39 diopters per meridian in hyperopia, 0.43 diopters in myopia and 0.42 for all eyes.

Scopolamine should not be relied upon in cases with good unaided distance vision when myopic or mixed astigmatic errors of refraction are found. Such eyes should be refracted under atropine.

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DISCUSSION

Dr. Ralph H. Woods, LaSalle: Hyperopia is subdivided into absolute, facultative, latent, which is again

divided into tonic spasm and clonic spasm. The only reason for using a cycloplegic at any time is to differentiate definitely between the facultative error and the latent error. A drug that does not give full and complete ciliary relaxation is not the correct drug to use for refraction.

The question arises, how can one tell when complete relaxation is secured? A widely dilated pupil does not of necessity indicate complete ciliary relaxation. One cannot intelligently prescribe for a case of hyperopia without first knowing and differentiating the absolute error, the facultative error and the latent error. There is a way of determining the absolute and facultative errors in a well done manifest, quickly and easily. The appropriate cycloplegic should relax all of the latent errors, thus making a complete differentiation. It is my opinion, based on thirty-two years of observation and experimentation, that a cycloplegic should never be used until the amplitude of accommodation is measured. This procedure is so simple and easy to do that there is no excuse for not doing it.

There are two or three ways to determine whether one has secured complete cycloplegia. The easiest and quickest is with the retinoscope. Working at 40 inches and placing a +1.00 in the trial frame to compensate for this distance, the red reflex should show no different motion with a fixation point at infinity than a fixation point at the working distance, or any other distance; or if using a fixation point at the working distance and moving it toward the eye, and the character of the motion is seen to change, it is then very certain that cycloplegia is not complete.

When atropine has been conscientiously used, according to directions, one may be certain of full and complete relaxation as determined by the above experiment, or other experiments. If scopolamine will answer these requirements then it has an equal rank with atropine. Up to the present time atropine is the only drug that has served my purpose for refraction.

Dr. F. W. Brodrick, Sterling: I enjoyed Dr. Bothman's paper and owe him an apology for not having a better discussion, but I am rather ignorant of the subject because of lack of experience with scopolamine. I will grant that there is a lot to be desired in the action of homatropine as a cycloplegic, and a number of years ago I tried to use scopolamine, but was scared out because of some untoward results, mostly likely caused by not having the punctum closed long enough. After having had several experiences of fainting, staggering, etc., I gave it up. Dr. Lancaster told me I had used the solution in too great strength—0.5%, and later my attention was called to an article by Ball stating that 0.1% solution of scopolamine was quite sufficient to produce cycloplegia and refraction, using one drop the night before refraction, one drop in the morning, and one drop when the patient presented at the office. This has been successful for dilating the pupil for other types of cases, and I have found a fairly weak solution would

give sufficient dilatation. I am very grateful for hearing this paper and am sure I shall try scopolamine again.

Dr. G. H. Mundt, Chicago: I have been interested in the use of scopolamine for many years, and have used it for refraction work. It is very difficult to discuss a paper in which there is so much statistical material—it is almost impossible to discuss intelligently a paper of that kind. Remember that scopolamine is a highly toxic medicament; there is no question about that. If you use 0.5% in the eye and repeat it in thirty minutes without due care—and I use due care because we put a very small drop in the conjunctival sac—you will have sometimes more violent reactions than Dr. Brodrick outlined. They will be climbing up the wall. There is no question about its toxicity, but it is a most valuable thing to use for refraction. It is a fine mydriatic. I believe as Dr. Bothman believes that it is a far superior cycloplegic for refraction to homatropine, and I should go further and say that it is almost as satisfactory for refraction as atropine. I should like to ask how long after the scopolamine has been used he uses the atropine. My experience is that it lasts frequently longer than seventy-two hours. I want to say that Dr. Woods is an optimist when he says that atropine when frequently used will completely relax the accommodation. Sometimes it does, sometimes it does not. I am advocating scopolamine for refractions. I am warning about it as highly toxic. I believe it is not safe to give to patients to use at home. It is not safe for anybody but a physician to use.

Dr. Louis Bothman, Chicago (closing): I agree with Dr. Woods that atropine is the drug we would like to use in all cases, but we occasionally run into difficulty with patients who object to being blurred for so long a period. The reason for the use of scopolamine was to learn if it would be almost as satisfactory as atropine. None of my cases had symptoms such as were described by Dr. Mundt, but scopolamine is quite toxic to some patients. If they do have a reaction, a dram of aromatic spirits of ammonia should be given by mouth. Scopolamine is unquestionably a better cycloplegic than homatropine, but it is not as good as atropine. I use it first, and if the relaxation is not satisfactory, use atropine later. When I say I am not satisfied, I mean with such cases that have 20/15 unaided vision which under scopolamine need a myopic correction of  $\frac{1}{2}$  diopter or less or even a mixed astigmatism correction. I do not feel that the patient would secure any relief from those kinds of glasses. I may find the same error under atropine. In that case, I feel satisfied because after a rest of a couple of weeks the patient may be comfortable without any glasses. With atropine you get relaxation of the ciliary muscles for a sufficiently long period to relieve the symptoms. We do insist on atropine in all children and all myopes. In other cases we try the other cycloplegic first.



## A REVIEW OF ANGINA PECTORIS AND CORONARY DISEASE

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A study of medical literature of the past decade might easily lead to the erroneous impression that the subject of coronary disease has been covered *ad surfeitem*. However, if considered relatively, it has actually been neglected. In the first place, heart disease in its broadest sense has usurped the foremost position as the cause of death in middle and advanced life. Furthermore, the particular form under consideration, coronary disease, displays a selectivity which reaches out and encompasses the mental types of occupation as opposed to the physical, and rather disconcertingly shows a partiality towards our own profession. Note, for example, the figures quoted by White<sup>1</sup> in a recent paper on the subject:

"In 1931, out of 3,000 deaths among American physicians, more than 1,000 were due to heart disease, leading cerebral hemorrhage by 700, and pneumonia by 750. In one week, out of 47 deaths amongst physicians, heart disease was listed in 21, and of those eight were coronary deaths."

The great frequency, therefore, of coronary disease in our own ranks makes this a very pertinent subject. In the second place, it can in no sense be considered a terminal disease, an essential end-result of decadent senility. For, while it is encountered in the later decades of life, it all too frequently descends on the prime of life and blots out virile manhood. Apropos this statement, the following excerpts are quoted from a recent publication by Eppinger and Levine:<sup>2</sup>

"This study concerns 141 fatal cases of angina pectoris. There were eleven men and thirty women, a ratio of four to one. The average age of onset for men was fifty-six and for women 58.1. The average duration of angina was 4.6 years for men, and 4.5 years for women. The average age at death was 60.7 years for men, and 62.7 for women."

We note, therefore, from this and other statistical reports that the bulk of coronary deaths occur early in the sixth decade.

Finally, if we consider coronary disease in its fullest sense, and include the anginal syndrome,

it not only calls for no apology, but on the contrary is entitled to intensive research and prolific discussion, for the subject in many of its phases is far from being closed.

A consideration of coronary disease, excluding angina pectoris, would make the subject vastly more simple, but in the same ratio less interesting. Refuting the old axiom that "discretion is the better part of valor," it might be well to take up the matter of angina pectoris at once.

Historically, while this syndrome was recognized centuries ago, and freely and intelligently recorded by many observers, because of its similarity in many respects with coronary occlusion, the entire subject remained muddled up to our present century. In this discussion many important names are deleted, and the following brief historical sketch must suffice: In 1700 Drelincourt recorded what was probably the earliest recognition of coronary sclerosis. In 1768, Heberden gave a vivid description of angina pectoris, limiting his observations to the acute attack.

John Hunter's very intimate portrayal of the disease as occurring within himself followed in 1794. In 1850, Cruveilhier reviewed the subject of coronary thrombosis and brought the existing data up to date. In our own century, Dock, in the latter part of the nineteenth century, contributed a beautiful paper describing coronary thrombosis. It remained, however, for our own Dr. James B. Herrick of Chicago to pave the way, through his epochal paper of 1912, for a clearer understanding and differentiation of the anginal syndrome from coronary occlusion.

In 1914, Mackenzie followed with a contribution emphasizing the part played by the coronaries in angina pectoris. Finally, the work of Sutton and Smith in Chicago, Pardee with his electrocardiographic findings, and Lewis of England have individually and collectively given a great stimulus to the study of both angina pectoris and coronary disease in general.

*Etiology and Mechanism of Angina Pectoris:* There are subjects more easily and confidently discussed than the mechanism of angina pectoris. It is true that within the past two decades opinion has veered and centered rather definitely on the coronaries, leaving those who hold for an aortic origin in the minority; however, certified proof is still in the offing. It would be well at this point to plagiarize boldly from Dr. Paul D.

1. White, Paul D.: The Diagnosis and Medical Treatment of Angina Pectoris. *Ann. Int. Med.*, 7: 218-228, 1933.

2. Eppinger, Eugene C., and Levine, Samuel A.: Angina Pectoris: Some Clinical Observations, with Special Reference to Prognosis. *Arch. Int. Med.*, 53: 120-130, 1934.

White's excellent paper,<sup>3</sup> which appeared in 1933:

"*Types and Causes of Angina Pectoris.* Four weighty arguments that have almost conclusively proved that the symptom (angina) is due to coronary insufficiency are:

"1. That angina pectoris and proved coronary occlusion give the same kind and location of pain.

"2. That angina pectoris is often complicated by coronary thrombosis, or indeed may occur for the first time after coronary thrombosis.

"3. That those cases of luetic aortitis with narrowing of the mouths of the coronaries are the ones that show angina pectoris, while those cases of luetic aortitis which fail to involve the coronary mouth, do not have the anginal syndrome, no matter how extensive the aortic involvement.

"4. Constriction of the coronary artery in the dog produces pain, while distention of the aorta does not. Thus we accept the premise that angina pectoris is caused by temporary coronary insufficiency and is *not* of aortic origin."

Accepting without hesitation the premise that the anginal syndrome is directly due to an anoxemia of the heart muscle, in turn due to a coronary insufficiency, we are next confronted with the cause or causes for this insufficiency.

Sclerosis of the coronary arteries, with a consequent loss of elasticity and a resultant narrowing of the lumen, certainly explains the vast bulk of anginas encountered in the later decades of life. Furthermore, the not too occasional anginas in early life are frequently due to the encroachment of luetic aortitis on the coronary mouths. There remains, however, a very appreciable group of fatal anginas, the explanation and mechanics of which are not so clear. I cannot accept as logical the fairly popular theory of a spasm or vasoconstriction of brittle, pipe-stem coronary arteries so complete as to result in fatal heart muscle anoxemia. In other words, I can conceive and readily accept that a calcified, narrowed coronary channel, through its diminished current brings about the anginal syndrome in its entirety—all except its most dramatic climax, death—that to me is not feasible.

*Differential Diagnosis of Angina Pectoris and Coronary Occlusion:* The diagnosis of angina pectoris is, as a rule, simple. It must be based upon either an intelligent story or the actual observation of a seizure. Physical signs, both preceding and following an attack, are notoriously unreliable or absent. The laboratory offers no help except possibly, in some instances, suggestive

electrocardiographic changes. Fortunately, however, an acute attack of angina pectoris presents an unmistakable picture which can hardly be missed or confused. So widespread is the knowledge concerning this event that the subject very frequently arrives at his own correct diagnosis without the advice of a physician. It seems futile and all too elementary to recount even in rapid order the incidents of an attack as follows:

A strangling sensation or sense of extreme oppression, substernal, brought on by physical effort, less frequently by an emotional explosion and rarely while at complete rest. The seizure is of brief duration, lasting a variable number of seconds or minutes and, unless terminating fatally, is unassociated with an appreciable degree of shock. Occasionally, but I feel far from regularly, the outstanding sensation of strangling gives way to substernal pain radiating to the shoulder and possibly the upper arm. While the diagnosis of angina pectoris is relatively simple, its differentiation from coronary occlusion is all too frequently confused. This is unfortunate, since both the management of these two conditions and the prognosis differ radically. While they have much in common as regards etiology, and possess symptoms that are closely related, they nevertheless display ample individuality to render an accurate diagnosis possible in the vast percentage of instances.

Points of differentiation are:

ANGINA PECTORIS	CORONARY OCCLUSION
1. Substernal strangling or pain. Brief duration—seconds or minutes.	1. Hours.
2. Brought on by physical effort almost always. (Exceptions are chiefly: Emotional explosions and nocturnal attacks due to gastrointestinal upsets.)	2. Physical effort not essential. Frequently occurs while at rest.
3. Symptoms of shock—absent.	3. Symptoms of shock—constantly.
4. Gastrointestinal complications rare.	4. Vomiting and abdominal pain frequent.
5. Physical signs (cardiac) meager or absent.	5. Physical signs, that is rapid, feeble pulse, weak heart tones—frequent.
6. Rapid relief and return to normal with nitrites.	6. No relief.
7. Temperature normal.	7. Elevation.
8. Leucocytosis absent.	8. Present.
9. Electrocardiographic changes variable and negligible.	9. Coronary T-wave (of Pardee) and evidence of myocardial infarction.
10. Pericardial friction rub absent.	10. Frequently present in 48 hours.

*Prognosis:* It has been pointed out that the differential diagnosis of angina pectoris from

3. White, Paul D.: The Diagnosis and Medical Treatment of Angina Pectoris. *Ann. Int. Med.*, 7: 218-228, 1933.



coronary occlusion affects vitally both the prognosis and management. It would seem all too elementary to recant that the former (angina pectoris) is but a syndrome which may occur and recur frequently, the patient in the interim not only enjoying good health, but in no wise incapacitated for work. Coronary occlusion, on the contrary, is always a serious event, not only entailing a high mortality but, if going on to recovery, resulting in permanent disability to an appreciable degree. However, a few thoughts are in order concerning the individual prognosis of both conditions.

In regard to angina pectoris, I feel we have become too lugubrious and pessimistic. Note, for example, the following quotation from a paper by Cotton:<sup>4</sup>

"The average anginal patient is likely to die within five years from the outset of symptoms," etc.

Or, again, we find the following statistical figures presented by Eppinger and Levine:<sup>5</sup>

"This study concerns 141 fatal cases of angina pectoris. The average age of onset for men was 56, and for women 58.1. The average duration of angina was 4.6 years for men, 4.5 years for women. The average age at death was 60.7 years for the men, and 62.7 for the women."

It seems unnecessary for me to state that I do not challenge the accuracy of these figures nor the results. It strikes me, however, that possibly these subjects were either not under continued and close observations or could not or did not live up to prescribed management. In other words, my own experience leaves me more optimistic in the matter of life expectancy in anginal subjects. I feel theirs is a happier and more cheerful lot.

If next we turn to Mackenzie's book, "Angina Pectoris,"<sup>6</sup> we read as follows:

"Concerning a series of 147 patients with angina pectoris. One man lived 31 years after his first attack, three lived twenty-five years, one twenty, seven more than fifteen years, and twenty-one for more than ten years. Thirty-three lived more than ten years and at the time the book was written, sixteen were still alive. Many of these patients, too, lived useful lives. Eight physicians continued to practice, others traveled, etc."

As regards my own observations and experience, I am unable to support my optimism with

impressive statistics. My files, however, reveal seven individuals with angina pectoris of more than ten years' standing and eleven of over six years. All are in reasonably good health and fairly active both physically and mentally.

When we approach the subject of coronary occlusion, however, our optimism wanes. Here, of a fact, is a grave and serious situation. The prognosis is influenced by various factors, notably, the age and general condition of the individual, the location, area and extent of cardiac infarction. The immediate outlook is most serious, since a fatal result will probably occur within the first few weeks. After that period, under conservative management, the prospects brighten. It has been stated,<sup>7</sup> "a second attack is relatively infrequent," etc. While this may have some substance, it will offer only little consolation to the individual who has weathered his storm. After all, his myocardium bears mute testimony of the previous insult. The area of the heart muscle replaced by fibrotic tissue must ever remain a source of potential rupture. Possibly every third individual will succumb to and during his acute attack, another third will survive for several years, and the remaining third live on. That third individual, however, gives us no great solace or joy. Unlike the anginal individual, he has been mortally wounded, and his life is more or less in jeopardy. If that statement seems too melancholy then, at least must we admit that his activities, both physical and mental, must be sharply restricted. If he builds about himself a protective wall, and walks in cloistered seclusion, then life goes on. All too seldom, however, is that practical save in fancied Utopia. Exceptions there are to prove the rule; individuals who regain full capacity and live out their expectancy. Even those few, however, accomplish this result through moderation and conservation.

*Treatment:* The treatment of angina pectoris concerns itself with the acute attack and the interval between seizures. Just as the former is more dramatic, so is its management more spectacular. However, while it may sound paradoxical and even heretical to many, I am convinced that not only are we able to afford the individual vastly more constructive assistance during the interval, but I am even inclined to believe he can

4. Cotton, T. F.: Brit. Med. Jour., 1: 368-370, 1932.

5. Eppinger, Eugene C. and Levine, Samuel A.: Arch. Int. Med., 53: 120-130, 1934.

6. Mackenzie, Sir James: Angina Pectoris: A Plea for Greater Optimism in Prognosis. Quoted by T. Stuart Hart, Amer. Heart Jour., 8: 755-760, 1933.

7. Parkinson, J.: Coronary Thrombosis. Brit. Med. Jour., 2: 549-553, 1932.

fairly safely, with greater distress it is true, pilot himself through his acute emergency unaided. In the first place, the knowledge of the symptom-complex of an acute seizure of angina pectoris, and the few and homely methods of combating it quickly and effectively, have attained such catholicity amongst lay people that the average individual is able to cope with the situation, particularly after a primary attack.

In the second place, I feel convinced an uncomplicated seizure of angina pectoris rarely results fatally. The explanation of the occasional sudden demise is problematic, but may well be an occult or at least undiscovered occlusion of a coronary filament. The average attack ceases as quickly as it appeared, and leaves the individual none the worse for his experience and that, too, with or without treatment. This statement can scarcely be construed as encouragement for self-management of a seizure, or a belittlement of its seriousness. It is merely intended to emphasize the dual point, that an acute attack is more or less self-limited, and that proper management of the interval is far more essential to the individual. However, few incidents in the travail of human suffering are more agonizing than an acute angina. This pain and strangling, due to a heart muscle temporarily pauperized of blood, are relieved quickly and effectively by postural rest and nitrites. Standing or sitting are preferable to lying, a circumstance which the individual with recurrent nocturnal seizures early appreciates. Sodium nitrite, gr. 1/100, used sublingually is less distasteful than the pungent amyl nitrite pearl, is just as effective and more readily adaptable. It affords relief almost instantly, but if carried as a prophylactic must be renewed at frequent intervals. So brief and simple is the management of the average anginal seizure. In elderly individuals there may be an after-clap in the form of subjective heart manifestations due to this temporary assault. They are, however, usually short-lived and respond to rest.

It would be difficult to visualize an individual who could demand, and in turn receive, more from an able, conscientious physician than the coronary patient. He, of a fact, places his life and his future in his advisor's custody. If he chooses wisely and cooperates fully and intelligently, his outlook is cheerful. He must accept the keynote of moderation—moderation in things physical—work, exercise, play, food and drink.

He will agree to a mental rehabilitation, the renouncement of worry, fear, anger and excitation. This by no means calls for curtailment of activities to the point of incapacitation. Quite the contrary, the anginal patient can with safety lead an active life. He must, it is true, taper down and make sundry sacrifices. The average sensible individual, if properly instructed, will be willing enough to meet these demands of safety. After all, man in his later years of life, particularly if he enjoys reasonable health and the use of his faculties, wants to live. As we slip into the third epoch of life, we live largely in the retrospect. We enjoy a kaleidoscopic review of the past. Old age muses wistfully on youth, irretrievably gone. Even the memories of toil in the heat of the noonday sun are, to the aged, sad but sweet. And so, in consolation, old age looks hopefully forward towards a setting sun and a calm and lengthening twilight. This exodus is possible to the anginal patient through moderation and self-denial. Strenuous work, exercise and play alike are dangerous and forbidden. The types, degree and extent of activity allowed vary with the individual. One is permitted a full eighteen holes of golf, for example; another dare not play at all; neither may play on a hilly course or in inclement weather. The safest criterion is the appearance of fatigue, which must always be avoided. Hours of rest must be prolonged, from the customary eight at night to ten and, when feasible, an afternoon rest period added. In the matter of food, quantity is far more important than type. In the absence of contraindications, a diet may be general, but should be bland and frugal. Of really major importance is the insistence upon a limited and simple meal at night. Many a nocturnal seizure of angina pectoris can be directly traced to a gastric debauch. Alcohol and sundry stimulants in moderation are indicated, in excess are potentially dangerous.

A mental readjustment is almost as essential as the physical. The individual need not develop an apathetic attitude towards life and its problems, but it is important that his perspective become tolerant, broad, aye, lackadaisical! He must understand that mental unrest may be his undoing, and must yield to calm and poise.

In the matter of the use and value of drugs in the management of the interval between anginal attacks, I have arrived at a definite stand,



contrary opinion notwithstanding. I feel that both the vasodilators (theocin, theocalcin, diuretin, etc.) and digitalis as well, are not only safely indicated, but very valuable and effective. Support of the former group will probably pass unchallenged, because of almost universal agreement. It is with digitalis that we are chiefly concerned. Many there are who hold that this drug must be considered warily, not only in coronary occlusion but in any degree of coronary disease, which *ipso facto* includes angina pectoris. Note, for example, excerpts from the splendid work done by Gilbert and his associates.<sup>8</sup>

"While a vasoconstrictor action cannot be predicted in any case, we feel that there is enough evidence of the presence of such an action to warrant a great deal of caution in the use of digitalis in coronary disease."

"Conclusion: In a series of experiments on dogs evidence was elicited indicating that digitalis bodies may exert a vasoconstrictor action on the coronary arteries."

As for me, I must accept the subjective and objective reaction of the anginal individual to digitalis as my criterion. If that be, as it actually is in the vast majority of instances, increased strength, lessened fatigue, absent or diminished heart symptoms of sundry varieties and, objectively, unmistakable evidence of improved heart tonus, then is the use of this drug vindicated.

A few brief statements concerning the management of coronary occlusion will suffice to close the subject. Sudden closure of a coronary vessel is as grave a situation as it is dramatic. Therefore it demands prompt, unyielding and thorough handling. Complete and absolute physical and mental rest is essential. It must be instituted *at once* and last . . . three months! Because six weeks suffice for the average coronary insult, does that justify the none too infrequent sudden deaths due to inadequacy? In repetition, man has an inherent desire to prolong his life and postpone death and will sacrifice three months to attain his objective.

The narcotics (morphine particularly) play an important part in accomplishing this desired complete relaxation. However, because of the protracted time element, the danger of habit formation must be borne in mind. It must be used judiciously, and the individual weaned at the earliest opportunity. The administration of digitalis in the presence of a fresh infarction is

fraught with uncertainty and danger, and is surely restricted to a dire emergency. The three months' rest period will blend cautiously with passive and later graded active exercise. A too sudden transition from rest to activity explains many coronary deaths.

And finally, in conclusion, the stricken individual who senses beyond any other incident in his past life that he has truly approached the chasm's brink and been snatched back needs moral support and encouragement as much as scientific guidance. If the sun is to shine for him again, then must we dispel the clouds and his fears and uncertainty must yield to courage and optimism.

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## THE OPHTHALMOSCOPIC SIGNS OF FAILING HEALTH

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The age of specialism in which we live tends to develop one sided individuals. The old saying that the specialist knows more and more about less and less, seems on occasion to be justifiably applied to the medical profession. New discoveries, new applications of old facts and realignments tending to greater medical and surgical efficiency are recognized by physicians and by the laity. And yet, there is an inclination on the part of all to become more engrossed in the particular isolated field in which they live or practice to the exclusion of the great broadening forces which surround them. Ophthalmologists are not immune, and this is to be regretted, for ophthalmoscopy is the common ground on which all departments of medicine may gather for the elucidation of their daily diagnostic problems.

This address will be devoted to a restatement of common, everyday observations, a review of some of the fundus conditions the symptoms of which may or may not have been recognized by the patient as an incident to failing health, which for our purpose may be defined as a decrease in mental or physical efficiency.

As patients come to us because of headache more often than for any other symptom, it is therefore, one of the most important subdivisions of the discussion. The frontal, occipital, parietal, temporal and vertex pains caused by uncorrected refractive errors or muscle anomalies

8. Gilbert, N. C., et al: Effective Digitalis on the Coronary Flow. Arch. Int. Med. 50: 668-683, 1933.

will not be included in this presentation, nor will the acute inflammatory changes in the eye or appendages, with the exception of the cursory mention of orbital inflammation.

When the optic nerve is impinged upon in its course through the orbit, the compression may lead to a papilledema, which is frequently characterized by an exudate along the major vessel trunks, by marked narrowing of the retinal arteries and great distention of the retinal veins, an edema involving the retina and nerve-head producing oblique retinal folds, or in the presence of a large, firm intraorbital mass, distinct retinal ridges. Such fundus changes should be searched for whenever there is external evidence of orbital disease.

The public is sinus conscious, in fact often in a state of hypersensitiveness. To them a pain in the head means the infection of sinus and sometimes it seems that the attending medical man assumes that the patient has made a correct diagnosis and treats him accordingly, although often the sinuses are unaffected and an ocular disease is the cause of the discomfort. When there is an actual pathological process in the frontals, the ethmoids, the sphenoids or the antra, the optic nerve may show inflammatory and edematous changes. This subject has been presented repeatedly, sometimes reflecting the bias of the reporter. Innumerable cases are on record where after the removal of the septic foci, or the mere shrinking and aeration of the sinus there is relief of pain and restoration of vision. But even in these favorable cases we are not justified in considering that the nasal condition was the only etiological factor for time has proved to every ophthalmologist who has had sufficient experience with this type, that although the application of adrenalin to the nasal mucosa is followed by rapid symptomatic relief, some months later there is a recurrence of the scotoma and the appearance of symptoms which change the diagnosis from a nasal lesion to multiple sclerosis. We should, therefore, be very guarded in our prognosis and remember that multiple sclerosis causes at least fifty per cent. of all retrobulbar neuritis cases, and that if patients are observed over long periods, I believe that the percentage will be found much higher. The fundus appearance is quite characteristic, and although with the older ophthalmoscopes the edema of the retina and nerve-head was not fre-

quently discovered or recognized, with the newest instruments it can be found in practically every one shortly after the onset of symptoms. Later the edema subsides, and in the pronounced case the temporal pallor of the disk becomes the dominant fundus sign.

In retrobulbar neuritis following the ingestion of certain drugs a similar edema is also evident although seemingly less intense in degree. The use of thallium as a depilatory has produced the same fundus changes, impaired visual acuity and field defects.

Acute cerebrospinal meningitis may cause congestion of the fundus, dilatation of the retinal veins, retinal edema and papilledema. When a patient complains of headache, has a fever and intense photophobia, the probability of meningeal irritation, usually an inflammation, should lead to the exclusion of meningitis before other diseases are considered. In meningitis actual choked disk is seemingly rare, but secondary atrophy with pallor of the nervehead is seen often enough to place it among the possibilities.

The fundus changes in tuberculous meningitis are usually those of the typical miliary lesions in the choroid, but may include retinal edema and papilledema.

Lethargic encephalitis is frequently ushered in with an attack of diplopia for which the ophthalmologist is consulted. The fundus lesions are few. The congestion of the disk with some edema is the usual picture and when the acute stage subsides the edema disappears and usually vision is unimpaired.

The headache from an intracranial aneurysm is most often frontal, one sided, and if the process is long continued causes a unilateral ptosis. The fundus picture is not pathognomonic. There may be no alteration in the retinal vessels, the veins may be engorged, the arteries small, or both veins and arteries contracted. An aneurysm may compress the optic nerve and cause not only atrophy, but also a large glaucomatous excavation. In marked cerebral sclerosis, the retinal vessels may show little deviation from normal.

In pulsating exophthalmos, either spontaneous or traumatic, there may be a great variety of changes. In the spontaneous type the fundus picture is generally that of senile atrophy with narrow arteries and veins. In the traumatic group, the fundus is often practically normal, although at other times there is an engorgement



of all the vessels with edema of the retina and occasionally the fluid is strictly limited to the disk, a papilledema. The characteristic pulsation of the eyeball and the typical bruit transmitted over orbit and head are enough to establish the diagnosis. When the common carotid artery is ligated to cure the disease, there may be an extreme edema of the retina, retinal hemorrhages and greatly distended veins with sufficient compression of the nerve to lead to subsequent atrophy, with the picture of white disk and attenuated vessels.

The fundus in exophthalmic goiter presents no distinctive pattern. If the thyroid involvement occurs from the fourth to the sixth decade, and if it has persisted for some time definite retinal, arteriosclerosis is found. Occasionally a typical hypertensive fundus is discovered. The malignant type of exophthalmic goiter, where the eyes begin to protrude after the removal of the thyroid, and where nothing seems to check the progressive proptosis, has always been considered serious and has led to many operative and mechanical measures for its relief. During the stage of advancing exophthalmos the optic nerve and surrounding retina become greatly swollen, wide elevated folds appear in the retina, both the veins and arteries are dilated and the vision is greatly impaired. When the orbital pressure is reduced, such as for example after a Naffziger operation the retinal edema subsides, the retinal circulation is restored to normal and unless the compression of the optic nerve has been too prolonged, function is restored. The end result depends upon the degree of secondary optic atrophy.

Headache accompanies all fevers. Its duration and location are sometimes dependent upon the cause. When typhoid fever was prevalent the primary symptom was frequently an intolerable headache. Fortunately, the disease is now rare in our part of the country. Another fever to which the general term brucellosis is applied has taken its place. This is widespread and seems to be increasing so rapidly that ophthalmologists must become familiar with it. An irregular temperature with general malaise and periods of regression in an otherwise seemingly healthy patient suggest the necessity of making a blood agglutination test. Most patients show nothing characteristic in their fundi. One with severe brucellosis had multiple ruptures of the choroid with great reduction in vision. This was a very

instructive case because the patient denied having had any serious accident. He said a speck of the corrosion material about a battery terminal had blown into his right eye and caused poor vision. And as absurd as it must seem to you, a physician went on the witness stand and swore that the fundus change was the result of this acid, although it had not caused any inflammation or left any scar even on the conjunctiva. Incidentally, when we criticize the members of other professions, we should not be unmindful of those in our own who live within the shadows of suspicion.

Arachnoiditis, whether traumatic, spontaneous or directly attributable to an intracranial infection, causes a severe headache. As the collection of fluid is frequently so located that it causes a true papilledema, it is well for us to be alert and carefully observe the changes in the fundus. In the typical case of intracranial involvement, there is an extreme papilledema, often characterized by massive exudates along the course of the blood vessels, particularly in the region of the nerve-head. When the pressure is relieved the edema subsides and unless the process has been too protracted the recovery is complete, both function and fundi return to their former normal state.

Edemas of the brain are among the most ordinary pathological causes of headache. Considerable time could be spent on the analysis of individual cases, the correlation of signs and symptoms and the variations in the appearances of nerve-head, but we must be content to call attention to only a few examples, particularly those which involve the pituitary gland where the changes in the fundus are frequently very slight and may be overlooked. There is practically always some edema of the nerve-head. Sometimes this can only be recognized with a narrow beam of light and by the contrast of red, green or yellow lights. The color of the disk has received much attention and as color interpretations are to a certain extent the result of individual experiences, it is the least trustworthy of any fundus sign.

When the pituitary is enlarged, and the chiasmal pressure continuous for a long time, there is a definite waxen pallor of the disk. If the growth increases there is a true atrophy of the nerve fibers, and the nerve-head becomes white.

Fortunately, in all brain tumors, the careful examination of the function of eye, central vision

and field will disclose other signs which can be correlated with the fundus appearance to make the diagnosis certain. Papilledema is of many types.

The diseases which we have mentioned up to this time are not rare, and yet not as frequently observed as hypertension or arteriosclerosis. So many articles have appeared on hypertension that I hesitate to add to the literature, and yet I feel that we can establish the hypertensive fundus changes if we disregard stages or degrees as distinct demarcations or definite delimitations. The separation of hypertension into four stages was a most admirable and practical method and even today has its use, but the clinician must not fail to recall that hypertensive changes are engrafted on normal fundi, and that no two eyes are alike. It should be obvious, therefore, that the signs of hypertension, especially the earliest ones, must differ just as the background on which they appear varies. There is little if any question but that the first sign of hypertension is an edema. This may, as we have said in relation to optic nerve changes, be so slight that it escapes the attention of the examiner. The fullness of the vessels is comparative, and unless the patient's fundus has been seen on previous occasions, it may be difficult to tell when the fundus vessels first show evidence of increased blood pressure. All ophthalmologists are agreed that as the pressure increases the artery becomes more taut, pushes the vein to one side, slightly indents the vein or even compresses it, that synchronously thicker patches of edema appear as snow-bank opacities in the retina with delicate striate hemorrhages.

As the hypertension continues the edema becomes greater, the snow-bank opacities more numerous, the hemorrhages larger, with exudate about them and the blood vessels show an increase in reflex and indentation. Later dark brown more or less granular areas develop in the deep retina about the posterior pole. These are of very great clinical and prognostic significance for they seem to come just before the patient enters the terminal stage in which the retinal edema and the snow-banks often almost disappear, and the hemorrhages become decidedly fewer.

Some patients take more than twenty years to complete this cycle while others pass through it to a fatal termination within a few months.

Every hypertensive will have arteriosclerosis if

he lives long enough. Whether this sclerosis is the result of spasm of the arteries or whether it follows a patchy alteration in the vessel is still discussed by those most competent to elucidate the changes. Arteriosclerosis in itself may be evident in the fundus as a single isolated white spot. The plaques may increase in number and extent, and form in vessels of various sizes. The entire vessel wall may be atheromatous; hemorrhages and exudates may form and complete the picture. Fundus arteriosclerosis may suggest the condition found within the skull, but it is by no means to be interpreted as an indication that the vessels in both are similar. Everyone knows that the background of the two eyes may be dissimilar. Most writers on ophthalmoscopy fail to distinguish between the hypertensive fundus and the arteriosclerotic fundus. The reasons for this are obvious, for the conditions encountered are often most confusing, and the case which starts as a frank hypertension soon becomes an arteriosclerosis with hypertension. Then again the changes which take place in the fundus of a patient suffering from nephritis vary from the typical macular star exudate with moderate retinal edema to those in which there is very little exudate and only changes in the caliber of the blood vessels. The differentiation between hypertension arteriosclerosis and nephritic retinitis can in the majority of cases be made. Some authors state that when we have arteriosclerotic changes in the fundus with low blood pressure, it is an indication that the pressure has been high, but this really does not seem to be a justifiable conclusion in all cases for many patients are examined who have no myocardial degeneration and yet the arteriosclerosis is advanced.

We could spend the evening discussing blood vessel alterations but we must pass to other conditions, and for a moment consider failing health as evidenced by nausea and vomiting. First we will consider pregnancy. The fundus changes which indicate a toxemia may be slight, consisting of artery spasm, or they may be intense with extensive exudate, large hemorrhages, great engorgement of the vessels and considerable reduction in vision. The ophthalmologist must play an important role in advising treatment for the prevention of fatal or damaging toxemias in pregnancy. He must recognize the early signs and must observe the patient repeatedly, so that



if the spasm of the artery is frequent, and more prolonged with an elevation in blood pressure he should advise emptying the uterus. If he does not a severe type of retinitis may develop which may be so marked as to lead to detachment of the retina, and call for an immediate Cesarean section. The wise obstetrician always has associated with him a competent ophthalmologist and together they make the decisions which not only save the life of the mother and child, but also preserve the sight of the patient.

After the hypertension of pregnancy is once established, the blood pressure seldom if ever returns to normal, so that the toxemia may not only cause the loss of the baby, but also undermine the health of the mother.

A sudden attack of nausea and vomiting may be the onset of an acute congestive glaucoma. Mild recurring spells may be brought about by chronic glaucoma due either to neglected iritis, uveitis, retinal detachment or an unchecked congestive attack. When the media is clear the distinctive excavation of the optic nerve is readily recognized.

Another state in which these prostrating symptoms may be found is acute alcohol poisoning after the general symptoms subside and it is apparent that the patient is partially or completely blind. Following the exposure to x-rays for the destruction of a malignant growth, a patient may become toxic. Under such conditions the fundus frequently shows hemorrhages, exudates and edema, and occasionally looks exactly like the well known picture of malignant endocarditis. In the terminal stage of pancreatitis, nausea and vomiting may also supervene. When patients suddenly discover that they are blind in one eye, they frequently have an attack of nausea and vomiting. This has been observed in embolism and in thrombosis.

Failing health may be the result of an unsuspected or inadequately treated syphilis. The manifestations of this disease are so numerous, and the inauguration of symptoms so capricious, that we can best illustrate it by means of the photographs to show early choroidal changes, the so-called pepper and salt fundus; the extensive disseminated choroiditis, the optic neuritis, the optic atrophy of locomotor ataxia, the migration of pigment into the perivascular sheaths, and the arteriosclerotic closure of some of the larger retinal vessels. The innumerable ways in which

this disease expresses itself in the fundus is a constant source of wonder.

Loss of weight may be the only reason why a patient seeks medical help. Diabetes is frequently seen in practice yet its very prevalence seems to delay the diagnosis and lead to confusion in its treatment. There are some outstanding facts regarding diabetes which should form the foundation on which recommendations are made. With the exception of lipemia retinalis a child does not show fundus changes even when the diabetes is extreme, long continued or fatal. Many adults may be emaciated as a result of chronic diabetes and have no fundus changes. A single flame-shaped hemorrhage may be the sign which attracts attention to the metabolic upset. The so-called diabetic retinitis is distinguished by yellowish deposits irregular in outline and in thickness scattered about the posterior pole. They disappear under proper dietary and insulin treatment. Arteriosclerosis, hypertension and diabetes are combined so often that the fundus picture is one of increased artery stiffness and visibility, compressed retinal veins, soft exudates and innumerable flame-shaped and rounded hemorrhages. Some observers believe that this picture is sufficiently distinctive to warrant the diagnosis of diabetes without any urine or blood examination, but this, I believe, is presuming too much. The fundus is a most sensitive indicator of the efficiency of the dietary and insulin treatment. Many times we have seen patients who were said to be under complete control, when in reality they had new exudates, fresh hemorrhages and definite progression of all the fundus changes. It is well to remember that sudden loss of vision may be caused by a macular hole as well as retrobulbar neuritis.

The change in weight which follows thyroid affections is well recognized, and as we said before, the alterations in the fundus are suggestive but by no means diagnostic.

The most common cause for loss of weight is tuberculosis. The changes in the fundus have been well described, and many drawings have illustrated them. The isolated tubercle of the choroid gives a curious reflecting sheen which probably is not found in any other choroidal lesion. As the tubercle enlarges the border remains undefined, and even after healing has taken place there is little migration of the pigment about the patch. Tuberculosis of the choroid

shows a tendency to recur. A tubercle may form near the old one or may be remote from it, but no matter how often there is a recrudescence, the individual lesion goes through the same process of increased opacity and regression with little permanent pigmentation except in the large, single conglobate tubercles where the border is densely pigmented and the destruction of the choroid and the retina so complete that the sclera is seen through the scar. Perhaps the most difficult tubercle to diagnose is the very large one which occurs in children. It has a smooth white surface with an occasional soft yellowish overlying mass and which, because of the age of the patient and the difficulty in making a detailed fundus examination may lead to the erroneous diagnosis of glioma of the retina. The recurring hemorrhages in the vitreous which are part of early ocular tuberculosis may at times be very perplexing. For instance, they may appear in a patient who has tuberculosis and who is also allergic, or they may come in one who seemingly has no tuberculosis, and yet suddenly dies of tuberculous peritonitis.

And, finally, the loss of weight in malignancies. Sarcoma of the choroid may first become evident as a small isolated more or less rounded dark elevation which enlarges pushing the retina forward, and may either cause radiating wrinkles in it or detachment of it. These conditions are too well known to need further reference. Occasionally the eye may be the site of a metastatic growth rather than of the primary tumor.

Two rare fundus conditions, one angiomas of retinae, and the other angioma, are illustrated to draw attention to their dissimilarities. In angiomas a hasty examination may lead one into error for at some time during the disease the appearance may be that which has often been described as pathognomonic of Bright's. However, a careful study of the fundus will always reveal the presence of one or more definite angiomas to which an entering artery can be traced and from which the draining vein can be followed. The other condition, angioma, may cause an immense enlargement of the retinal vessels and make a picture that is so striking that once seen it can never be forgotten or misdiagnosed.

As ophthalmologists we are bound to the great group of physicians who are interested in the preservation of health and the recovery from

disease. We are not and must never be segregated from that body, but must make every effort and utilize every opportunity to become more familiar with the advances in the healing art and be prepared to render opinions based on the knowledge and understanding of medicine. We must always remember that although we are concentrating our attention upon the eye, that that organ is part of the body reflecting the conditions found therein. And, further, that the delicacy of the retinal vessels and the appearance of the end of an important nerve places us in a position to interpret many of the signs of general diseases but that our explanations can only be correct if we maintain our contact with general medicine.

United as a profession we progress, isolated as specialists we fail.

344 State Street.

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## CLINICAL EXPERIENCE IN THE TREATMENT OF ARTHRITIS WITH MASSIVE DOSES OF VITAMIN D

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*Introduction.* Chronic arthritis is recognized today as the most important economic problem that a chronic disease presents.

Accurate statistics are lacking in the United States. A house to house survey in the state of Massachusetts revealed more chronic arthritis in that state than cancer, tuberculosis and heart disease combined. It has been estimated that there are over three million chronic arthritis patients in the United States. It is listed as "Public

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Arthritis Clinic, Research and Educational Hospital, and Department of Medicine, College of Medicine, University of Illinois.

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At various stages this investigation has been supported in part by grants from Mead Johnson and Company; the Graduate School Research Fund, University of Illinois; the American Academy of Arts and Sciences; the Wisconsin Alumni Research Foundation; the Committee on Therapeutic Research of the American Medical Association; the Phi Rho Sigma Medical Fraternity; and the Nutrition Research Laboratories.

Vitamin D preparations used include:

1. Viosterol (1,000,000 units per gram) supplied by Mead Johnson and Company, Winthrop Chemical Company, Parke Davis and Company, Abbott Laboratories.
2. Calciferol supplied by Mead Johnson and Company, Winthrop Chemical Company, Glaxo Laboratories.
3. Drisdol, supplied by Winthrop Chemical Company.
4. A solid preparation known as Ertron, supplied by Nutrition Research Laboratories.



Health Enemy No. 10" by the United States Public Health Service.

Due to the many divergent theories as to the causes of arthritis, various forms of therapy have been suggested and while the literature is full of enthusiastic reports about specific forms of therapy for arthritis, the general program of treatment accepted by all those interested in this disease differs very little. It is rather the combination of many procedures, every observer having his own opinion as to which factor is the most beneficial. It is with this in mind that we are presenting a program of treatment for arthritis in which vitamin D therapy is stressed.

*Types.* Much has been written on the types of arthritis. The American Committee for the Control of Rheumatism has adopted the classification of atrophic arthritis (rheumatoid) and hypertrophic arthritis (osteo-arthritis). While one may agree with the significance of this anatomic pathologic classification, it is of limited value in so far as treatment is concerned. Most observers agree that chronic arthritis is not merely a disturbance of the joints, but it is a generalized systemic imbalance. Certain it is that not only are both types of arthritis coexistent in the same patient, but even in the same joint. It may perhaps be asked whether the hypertrophic form is not merely a continuation of the atrophic—or that the atrophic ends at the age when the hypertrophic begins. Realizing that both types of arthritis have a common denominator in their manifestations of vascular, nervous, gastrointestinal and locomotor disturbances, and that each type perhaps reacts to a certain stimulus at a given age, it would be a very narrow point of view to assume that one drug or one form of therapy would benefit the arthritic of one type and would be contra-indicated in the other type. Arthritis in the broad sense is a systemic disorder and the treatment must be directed to correct this constitutional imbalance.

*Treatment.* From the foregoing statements it is evident that any management of arthritis should have for its purpose the re-establishment of the physiologic balance of vascular, nervous, gastrointestinal and locomotor functions.

In the Arthritis Clinic we have divided the treatment into two phases: constitutional and local. The procedures along the line of constitutional treatment are as follows:

1. Massive doses of vitamin D.
2. Rest.
3. Regulation of diet.
4. Correction of bowel habits.
5. Removal of foci of infection.
6. Medicinal care.

*Massive Doses of Vitamin D.* It should be stated at the start that we have never contended that vitamin D is a specific therapy for arthritis. We have well realized that this disease has no specific causative agent, and there can be no single cure. From observations in a large number of cases, and from recent published reports, as well as from private communications, we have concluded that vitamin D in massive doses is a most valuable adjunct to the present armamentarium in the treatment of arthritis. The following case reports illustrate our procedure of treatment. It will be apparent from the reports of these cases that to reestablish the physiologic equilibrium we resorted to other measures in addition to vitamin D.

Case 1. L. S. Atrophic arthritis. White, male, aged 49, clothing cutter, was first seen Jan. 5, 1934, complaining of pain and swelling of wrists, knees, ankles, feet and shoulders for one year. He was in good health until November 1932, when he suddenly developed numbness in the fingers of the right hand followed by pain and stiffness of the right wrist. Two weeks later his left wrist and shoulders became involved. He was free of swelling for over a year. In January, 1933, he noticed pain, swelling and stiffness in both knees that gradually became worse until he became completely disabled and could not extend his legs. He was treated with streptococcus vaccine, hot baths, salicylates and high colonic flushings with no results.

On examination the patient did not appear acutely ill. On attempting to walk he assumed a position of marked flexion of the hips, limited extension of legs and on walking his feet scraped along the floor. There was swelling, stiffness and tenderness of the wrists, shoulders, elbows, knees, ankles and feet.

Throat culture revealed no hemolytic streptococci. Urine was not abnormal. Hemoglobin 11 gms., erythrocytes 4,540,000, leukocytes 6,500, gastric analysis showed free acid 14 total acid 46, stools negative for blood. Gastrointestinal x-ray examination revealed left side stasis. X-ray examination January 26, 1934; hand revealed narrowing of joint spaces in phalanges. Early development of punched out areas on second phalanges. Diffused bone atrophy, especially metacarpal and phalangeal. Same finding in knees. Foci of infection were not found.

While in the hospital this patient received daily 200,000 I. U. vitamin D beginning Jan. 19, 1934; on Feb. 5 this dose was increased to 450,000 I. U. This

patient stayed in the hospital from Jan. 5, 1934, to Feb. 22, 1934, during which time his condition became very much improved, so much so that he was able to walk without much difficulty. He could bend his knees without much effort and had almost complete extension of knees and complete motion of hands, wrists, elbows and shoulders with no muscle spasm. He also gained weight and felt much stronger when he was discharged on March 12, 1934.

Since then he has continued 180,000 I. U. vitamin D with periods of therapeutic vacation of two weeks to two months. In June, 1934, he resumed work part time. He increased working time gradually and now works full time. At first he became worse when not taking the vitamin D and recovered promptly upon resuming it. Recently he found that when he abstained for three months he had a recurrence of pain in the fingers of both hands. This was accompanied by swelling. Since that time he has resumed the medication of 180,000 I. U. vitamin D and has been entirely free of pain and sensitivity to changes of weather. He has no limitation of motion of hands, wrists, knees, ankles and feet; is able to walk long distances after work without any discomfort.

Sept. 1, 1936, x-ray check-up: Recalcification of distal epiphyses of radius, ulna and carpals of both hands, metacarpals show sharper outline of cortical margins and marked homogeneity of cancellous portion. A similar picture is found in both knees.

Case 2. H. S. Atrophic arthritis, male, white, aged 43, street car conductor, was first seen on March 22, 1934, complaining of pain and stiffness of joints especially knees, of 2½ years duration. Onset gradual in ball of right foot with pain on standing. This pain was relieved by diathermy after 3 weeks of treatment. He was well for 6 months when both knees became painful, swollen and progressively stiff. Soon after the left ankle became involved followed shortly by the left shoulder and elbow. Lumbosacral region of back and neck became stiff. Aspirin and salicylates offered temporary relief, vaccine no relief (4 doses), heat and massage some relief, and blanket sweats aggravated the condition. He was constipated and had lost considerable weight.

He had frequent sore throats, upper respiratory infections, and in 1919 had had influenza.

Examination revealed fusiform swelling of left fourth finger with bilateral muscular weakness. Both knees showed marked swelling and local heat with superficial venous dilatation, marked coarse crepitus and limitation of extension. Patient walked with two canes, dragged feet along floor in shuffling steps and required assistance to get in and out of bed. No foci of infection were found in teeth, nose, or throat.

X-ray: examination of hips on April 24, 1934, revealed narrowing of joint, especially on the right, diffused atrophy of hands and wrists; narrowing of joint spaces, thickening of cortex, especially on the right, lateral displacement of wrist joint, punched out area on lateral border of right radius, blurring of small bones, especially the semilunar, marked atrophy

of tibia, less atrophy of calcaneus, marked narrowing of articular surfaces of the knees, patella appeared fixed and anterior surfaces roughened, right tibia revealed a punched out area on the posterior aspect, marked diffused spotty atrophy of bones.

Laboratory: Urine was negative. Hemoglobin 12½ gms. R. B. C. 4,130,000. W. B. C. 8,600. Blood chemistry: Glucose 81 mgm., N. P. N. 26 mgm., CO<sub>2</sub> combining power 46. Blood Kahn negative.

Hospital management: This patient received vitamin D starting with 200,000 I. U. daily; on April 9, 1934, gradually increasing to 250,000 I. U. The patient was partly ambulatory and performed exercises in bed. On May 2, 1934, he began graduated walking exercises. He left the hospital on May 23, 1934, walking without support and improved subjectively and objectively.

Follow-up: He has been observed for two years after discharge from the hospital, and has been seen at intervals of 3 weeks. In this period he has continued to improve in weight and strength. He has less stiffness in his knees and hands. Seventeen months after discharge he was well enough to work as a street car conductor, and resumed his employment. Since leaving the hospital he has continued the viosterol in decreasing doses for periods of 2 weeks followed by 1 week therapeutic vacation. He has maintained the diminished sensitivity to weather changes, an improvement which first appeared while undergoing hospital treatment.

Aug. 8, 1936. X-ray examination of pelvis and both hips showed general recalcification and reestablishment of trabeculation and thickening of cortex throughout involved areas.

Just what physiologic influence vitamin D has on individuals who show arthritic manifestations we are as yet not ready to say. Whether patients who are benefited by vitamin D therapy suffer from a vitamin deficiency, as has been suggested by Livingston<sup>1</sup>, is rather questionable. Extensive long time study on mineral metabolism<sup>2</sup> of arthritic patients under controlled conditions during hospitalization has given some information about the mechanism of action of vitamin D. During preliminary control periods most arthritis patients show a condition of imbalance in calcium metabolism which is not reflected in alterations in concentration in the blood stream, but is manifested by disturbed balance between the amount ingested and that excreted. Sometimes there was pronounced positive balance which means that for considerable periods the subject had not been eliminating calcium in proportion to the intake. This was commonly, although not constantly, seen in those cases in which extensive ankylosis and flexion deformities were seen.

In other cases there was an irregular negative balance alternating with an approximately even



balance. For periods of several days at a time there was a large increase in the fecal calcium output with practically a constant level of excretion in the urine. This means that either the ingested calcium is not absorbed and accumulates in the atonic gut and is then eliminated whenever motor activity in the gut is augmented or else there is extraordinarily rapid excretion through the intestinal mucosa. At present there is no direct evidence that would enable one to decide which of these processes predominates but it seems more probable that the first is the true explanation.

At any rate, when vitamin D therapy is instituted the blood calcium level is likely to be somewhat increased for a few days. Following this there is usually a progressive increase in the urinary calcium on a shift from feces to urine. With this the blood calcium returns to the normal level. Clinical improvement becomes apparent with the increased calcium output in the urine. If the observation is continued long enough there is a tendency to establish an approximately even balance between intake and excretion regardless of the direction of imbalance originally present.

Finally, the urinary calcium output gradually falls off progressively and a slight but fairly constant positive balance is established. X-ray examination now shows recalcification of bones and restoration of trabecular patterns. So long as this process continues there is progressive clinical improvement. It is tentatively suggested that the limit of improvement under vitamin D therapy coincides with the limit of tolerance to recalcification without overcalcification. Further clinical improvement must, therefore, be accomplished by other forms of therapy. The absorption of exostoses is apparently accomplished during the period of high elimination of calcium in the urine.

Contrary to a recent report by Wyatt<sup>3</sup> and his coworkers that patients with gastrointestinal disturbances do not tolerate vitamin D in massive doses, we have not found this to be true in our experience. The only contraindications for vitamin D that we have found are cardiovascular and renal disease. Neither have we had in our experience the high percentage of intolerance to vitamin D in massive doses as reported by Wyatt—nor are we certain that all manifestations of nausea were due to the vitamin D therapy. Most arthritis patients suffer from gastrointestinal disorders and just how much nausea that is re-

ported is due to the gastrointestinal disturbance per se and how much is due to the therapy is questionable. However, caution should be exercised and the medication discontinued when the patient complains of nausea which is the most common early symptom of intolerance. The next most common symptom of toxicity is frequency of urination without necessarily a polyuria. Other manifestations of early symptoms are lassitude, anorexia, polydipsia. Still more severe signs of toxicity are vomiting, colicky gastrointestinal pain and diarrhea. A word of caution should be mentioned here: while the toxicity of vitamin D in the treatment of arthritis is no more hazardous than other drugs used for any ailment in medicine, it, like any other drug, must be administered with care and like any other drug may not be tolerated by certain patients. The initial doses should therefore be small and if symptoms of intolerance are manifested by the patient it should be immediately discontinued. The patient should be instructed to be on guard for symptoms of nausea and increased urination—the early symptoms of intolerance. If the medication is discontinued when early signs of toxicity are manifested the patient suffers no ill effects, and the treatment is resumed within ten days to two weeks, starting again with a minimal dose. Another precaution we have found it necessary to take to combat toxicity is the simultaneous administration of 6 grams of brewer's yeast daily.

In the Clinic at the Research Hospital, we start with the initial dose of 150,000 units daily, increasing the dose by 30,000 units daily every two weeks, till 300,000 units are given. The maintenance of this dose depends on the clinical progress of the patient. Some cases show improvement in two weeks, while others may not show any favorable results for six months. Results are evaluated in three ways:

1. Clinical.
2. X-ray.
3. Laboratory.

The patients who reacted favorably manifested the following clinical improvement: decreased pain, decreased swelling, decreased vasomotor instability; increased appetite, increased mobility of affected joints, increase in weight. Most of the patients reported lessened fatigue, lessened sensitivity to weather changes and increased muscular tone. In nearly all cases the cold

clammy sweating of the hands was markedly diminished, and gastrointestinal disturbances were less noticeable. In patients who manifest clinical improvement the dose is gradually reduced after six months and they are kept on a maintenance dose of 180,000 units with periods of two weeks therapeutic rest every four months.

X-ray findings show recalcification of the bones.

Laboratory findings show decreased sedimentation rates; increased R.B.C.

Earlier in the paper I stated that our attitude concerning vitamin D is such that we consider it an important adjunct in the present treatment of arthritis, and that physiologic equilibrium cannot be obtained through the medication of vitamin D alone. The next factor in our constitutional therapy is *Rest*.

Every new patient is considered as an acute case and as such he is confined to bed as much as possible and the degree of activity is instituted according to his state of health. With the instituting of rest we attempt to correct the nervous, vascular and gastrointestinal imbalance. By being confined to bed the patient is relieved of the strain of the sympathetic nervous system<sup>4</sup>, the capillary circulation again becomes stabilized, the low grade edema so commonly observed in arthritics is diminished. The rest, however, should not be of such nature as to allow ankylosis. Exercises should be allowed within the painless arc of motion. The saying that, "one movement a day keeps adhesions away" is most applicable in the atrophic cases. Many of the arthritic patients are maladjusted to their environment and tend to become neurotics. Adjustment to their environments will usually be followed by reestablished equilibrium of bodily functions.

*Diet.* Nearly every conceivable diet has been tried in arthritis. There was a time when the disease was associated with accumulation of uric acid in the body, and red meats and acid fruits were therefore forbidden. Today we realize that uric acid plays only a minor part in arthritis, if it is to be considered at all, and this concept of diet has been discarded. There are those who still adhere conscientiously to the low carbohydrate and high protein diet. Our plan has been to place the patient on a balanced diet most suited for the particular individual. If the patient is underweight and anemic, he is placed on a high caloric diet with no limitation of the

concentrated carbohydrate foods, vitamins, green vegetables and fruits. Obese patients are placed on a diet including low amounts of starch and fat foods. The diet is regulated according to the needs of the patient. Food allergies are ruled out whenever possible. Generally speaking, once the patient begins to gain weight he should not be allowed to become overweight. On the average one should allow from 25 to 30 calories per kilo body weight; protein, 1 gram per kilo body weight and a reduced quantity of concentrated carbohydrate foods. The sole benefit derived from reduced carbohydrate foodstuff is probably that it allows the patient ample appetite for vitamin and mineral foods.

*Bowel Habits.* There still is considerable controversy as to the role played by the bowel as a factor in arthritis. There are those who advocate intestinal antiseptics and colonic irrigations. We have never followed any such procedures. In patients who suffer from gastrointestinal disturbance, we endeavor to correct the condition. We do not use oil to promote intestinal elimination because there is a possibility that oil interferes with the absorption of vitamin D. Mild cathartics are, therefore, advised.

*Foci of Infection.* We do not disregard the matter of foci of infection. If the patient presents a history of arthritis of several years standing, we do not look for foci of infection. It is claimed by many observers (Holbrook, Crowe) that removal of foci in arthritis of long duration is rarely beneficial. If, however, the disease is of short duration, we attempt to remove all possible sources of infection.

*Medicinal.* We do not resort regularly to drugs for the alleviation of pain; it is only occasionally that we prescribe acetyl salicylic acid in 5 grain doses. We have used elixir glycooll in private patients who complain of fatigue. To patients who show symptoms of neuritis, we give vitamin B.

Vaccine was used only in those cases that failed to respond favorably to vitamin D after a six month trial. To date, only one out of six cases of this series has been improved by vaccine therapy.

*Local Measures.* Passive exercise is prescribed to patients at rest to avoid muscular atrophy and the formation of new adhesions. This exercise without weight bearing is gradually increased in duration, but always within the painless range.



*Heat* in any form, particularly hot packs of saturated magnesium sulphate, increases peripheral circulation and decreases pain. *Massage*, gently stroking the involved joint, is also found to be greatly beneficial.

*Prevention of Deformity.* While there is no difference in the general treatment of hypertrophic and atrophic arthritis, it is very important to prevent deformities which are very common in the atrophic type. These deformities are usually flexion of the knees, elbows, wrists, fingers and hips. The joints should be kept in extension by splints, casts, or other similar devices. It is important that should the joint become ankylosed, the fixation should be in the optimal position for use.

In our experience, exacerbations do occur, but not definitely related to the interval of rest from therapy, or the permanent discontinuance of vitamin D. The time element should be emphasized strongly to the patient if adequate treatment and relief is expected. It has been suggested<sup>5</sup> that the time required to arrest the progress of an arthritic condition is analogous to the time required for the arrest of pulmonary tuberculosis. A patient with active tuberculosis seeking relief expects to be under active treatment by the physician not for weeks, but for months, or years. A patient seeking relief from arthritis should be made to understand that the treatment of arthritis can be compared with that of tuberculosis and in arthritis as in tuberculosis he may expect the abeyance of the active process only as long as he follows the fundamental principles of the treatment; that exacerbations of the condition may follow, as in tuberculosis, by violation of these principles.

*Conclusion.* In closing, it may be said that while there is no specific treatment for arthritis, yet with the present form of therapy 75 to 80% of the cases can be benefited to an appreciable extent and the progress of the disease arrested. Again we repeat that we have found vitamin D in massive doses to be an important adjunct in the treatment of arthritis. Investigations are being carried on at present to determine in which group of cases vitamin D will be most beneficial. If this paper has done nothing more than to arouse further interest in intelligent treatment of this widespread and stubborn disease, it will have served its purpose.

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## PROSTATITIS AND VESICULITIS:

### Treatment with Local Heat

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CHICAGO

The physiological basis for the use of heat as a therapeutic agent was not unknown to the ancients, and among the Romans heat was commonly applied in the form of radiant heat and hot baths. In the modern literature on the subject (which includes among others the excellent writings of H. C. Bazett, Ralph Pemberton, George Gellhorn, E. P. Cumberbatch, and H. E. Stewart) it is pointed out repeatedly that restoration, like all other progressive activities of the living organism, is brought about by active hyperemia—and that the best means of producing such hyperemia artificially is by use of heat.

Careful clinical work and experimentation has shown that heat places the tissues in a condition to respond better, in that they are softened and the dilated lymphatics and blood channels are probably able to remove more quickly than otherwise the fluids and metabolic detritus displaced by massage or other activation. Further clinical studies show that any change in temperature has a profound effect on the metabolic changes of any tissue.

The impressive amount and quality of recent work in the field of heat therapy prompted the writer early in 1935 to undertake clinical study of its possibilities in the treatment of simple prostatitis and cases of prostatitis combined with vesiculitis on a venereal basis.

In order to eliminate possibility of confusing factors, the study was at the outset confined to a single method of application of local heat. Thus, this paper makes no attempt to outline

or to discuss the relative merits of the various forms of heat therapy. Consideration has been given only to a method by which local heat is introduced directly into the prostatic area by means of a rectal applicator supplying constant heat. And the term "method" as here used embraces not only the specific heat appliance used, but also the manner in which treatment was regularized, i. e., office treatments at fixed intervals and carefully supervised treatments by the patient himself in his home, on a fixed schedule.

The series of individual cases here presented, and the tabulation of treatment results obtained, are therefore offered for whatever they may contribute to solution of the general practitioner's problem: "*What principle and what method appears to offer the most efficient treatment for simple prostatitis?*"

The study was begun in February, 1935, and extends through April, 1936. Initial work was confined to selection of a constant heat rectal applicator capable of demonstrating a measurable degree of heat penetration into the urethra. It was recognized that there are a number of simple prostatic heat applicators on the market; many of them extremely simple of operation, comparatively inexpensive, and quite safe for use by the patient under a physician's direction. Also, the necessity for obtaining a number of such appliances (duplicates in electrical dependability, heat production, etc.) was recognized.

An applicator of acceptable design and rating was selected (see descriptive data, Table 1) and a special "heat penetration" test was made. Six subjects were selected for this test, the method and results of which are shown in Table 2. Proof of heat penetration through a demonstrable section of tissue was deemed highly satisfactory for my purpose, and specially adapted prostate case record forms were immediately devised (see Tables 3 and 4). The study proper was opened on March 25, 1935, with form entry of the first case in the series.

Forty cases in all were recorded, with division of this number into two groups of twenty patients each. Group I was examined and given one office treatment with the applicator weekly, and each patient in this group was furnished with a duplicate appliance for an instructed daily application by the patient in his home.

Group 2 was used as a control group, and each patient in this group received an office treatment daily, with office examination weekly.

The period over which treatments extended for each of the forty cases averaged approximately three months. The duration of each daily treatment (whether given in the office or taken under instruction by the patient himself) ranged from forty minutes to one hour, with an average of about fifty minutes. In each case the degree of heat used was determined by personal tolerance of the patient, with adjustment just below maximum tolerance.<sup>1</sup>

Urethral smears and microscopical examination preceded institution of treatment in each case, with subsequent smears at regular intervals of one week until case was discharged. The cases showing infection at the outset required on the average approximately five weeks to obtain a negative smear.

The progress of improvement in the two groups advanced with little if any variation in rate. Assuming that each patient followed the simple routine outlined for his home applications, there is no reason to believe that there should be a variation. The composite tables (shown in Tables 5 and 6) record the results obtained in Groups 1 and 2 respectively.

The writer believes the picture disclosed by this study to be significant. Reference to tables shown in Tables 5 and 6 will show the following results for the forty cases studied:

- 15 cases show excellent results.
- 6 cases show no marked change.
- 15 cases show good results.
- 4 cases show fair results.

In other words, only six cases (or 15%) of the total failed to obtain outstanding benefit. Thirty cases (75%) were discharged as cured. Four cases (10%) showed fair improvement.

It would appear that the possibilities made apparent by this large positive figure might justify extended research. Elaboration of method, together with expansion of the patient list would probably do much to complete the picture here indicated.

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1. An explanation of the device for regulation of heat production is given in the note accompanying Table 1.



TABLE 1. DESCRIPTION OF HEAT APPLICATOR

Mechanical details (as furnished by the manufacturer):

*Applicator:* Polished hard-rubber surface barrel, with 4½-inch length over all (dull tapered tip on introductory end). Greatest diameter of barrel (at swells) 11/16 inch. Heating element consists of 18 inches of .008 nichrome wire, of 10.2 to 10.5 Ohms resistance per foot.

*Connections:* Ten feet of cord, with female connector on applicator end and "series current" tap (for electric lamp in series) at wall plug end. Cord is equipped with regular "feed-through" switch, spaced 18 inches from applicator end.

## Electrical Rating:

*Size of Lamp	Input Voltage	Ampere Consumption Per Hour	Applicator Unit Total Resistance
40 Watt	5 Volts	.3333	15 Ohms
50 Watt	7 Volts	.4066	15 Ohms
60 Watt	8 Volts	.5333	15 Ohms

\*Standard electric lamps of 40, 50, and 60 Watt capacities (each lamp furnishing a fixed resistance in the complete circuit) are used to furnish variable resistance, and thus variable heat intensity, in the applicator itself. Insertion of a lamp in the "series current" tap completes the circuit. Thus, the 40 watt lamp gives *lowest* applicator heat production—the 60 watt lamp gives *highest* applicator heat production. The table shown immediately above illustrates this temperature regulation factor in terms of absolute voltage input and resultant ampere consumption.

TABLE 2. HEAT PENETRATION TEST ON RECTAL APPLICATOR  
(By thermometric measurement through urethra)

Case Number	Temperatures at time current on, applicator inserted, and test begun			Application in minutes	Temperatures at time current was turned off			Increase in temperature urethral
	Room	Mouth	Urethra		Room	Mouth	Urethra	
4037	76°	98.4°	99°	30	75°	98.4°	100°	1.0°
4050	76	98.6	99	30	74	98.6	100.5	1.5
4057	76	98.4	99	30	74	98.4	100.5	1.5
4019	76	98.4	99	60	75	98.4	101	2.0
4028	74	98.2	99	60	76	98.2	101	2.0
4034	74	98.6	99	60	76	98.6	101.5	2.5

The following instruments were used in performing the above tests:

1. Conventional intra-rectal heat applicator (described in Figure 1).
2. Fahrenheit thermometer, special type (German manufacture) adapted for recording tissue temperature in diathermy work.
3. B&D clinical thermometer, Certified, as manufactured by Becton, Dickinson & Co.
- \*4. Wall thermometer, special type used by Swift & Co., Chicago, in meat refrigeration plants.
5. Hamilton watch, 17 jewel, No. 983132, Hamilton Watch Co., Lancaster, Pa.
6. Mazda 60 watt, 120 volt lamp.

\*Room temperature controlled by Minneapolis-Honeywell system—building heated by oil.

NOTE: The series of tests tabulated above were made during the first three weeks of February, 1935, on my own list of patients, and in my offices at 716 Wellington, Avenue, Chicago, Illinois.

TABLE 3  
GROUP 1

Name—R. K. Address—.....  
Case Number—5010. Age—44. Occupation—Electrician.  
Complaint—Pains in rectum, always tired, general ill health; piles.  
Diagnosis—Prostatitis, chronic—on old venereal basis; vesiculitis on right side.

## TREATMENTS

1935 Date	Length of Time	Type of Instrument Used	Patient's Own Report	Laboratory Findings	Remarks
		Intra-rectal heat applicator		Gram positive diplo. intra-cellular and extra-cellular	Prostate much enlarged and boggy, with tenderness
4/ 5	1 hour	Do	No improvement		
4/12	1 hour	Do	No improvement		Slightly improved
4/19	1 hour	Do	No improvement		Slightly improved
4/26	1 hour	Do	Slight improvement		Slightly improved
5/ 3	1 hour	Do	Slight improvement		Slightly improved
5/10	1 hour	Do	Slight improvement	No bacteria found	Slightly improved
5/17	1 hour	Do	Much improved	Negative	Slightly improved
5/24	1 hour	Do	Much improved	Negative	Tenderness gone
5/31	1 hour	Do	No complaints	Negative	Swelling reduced, marked
6/ 7	1 hour	Do	No complaints	Negative	Prostate normal
6/14	1 hour	Do	No complaints	Negative	Prostate normal
6/21	1 hour	Do	No complaints	Negative	Prostate normal
6/28	1 hour	Do	No complaints	Negative	Prostate normal

Patient was discharged on July 1, 1935. Patient stated all symptoms had disappeared. Final examination revealed complete recovery.

TABLE 4  
GROUP 2

Name—L. W. G. (Married.)  
Case Number 7980. Age—45.  
Address—.....  
Occupation—Lahorer.  
Complaint—Pains in back and rectum; impotence; failing health; pains and distress worse while on feet.  
Diagnosis—Hypertrophy of prostate—cause undetermined.

TREATMENTS

1936 Date	Length of Time	Type of Instrument used	Patents Own Report	Laborator Findings	Remarks
		Intra-rectal heat applicator		Negative	Prostate hardened and slightly enlarged
2/1-7	40 min.	Do	No change	Negative	No change
2/8-16	40 min.	Do	No change	Negative	No change
2/17-27	40 min.	Do	Feels much better	Negative	Prostate somewhat better
2/28-3/5	40 min.	Do	Marked improvement	Negative	Prostate normal in size
3/6-14	40 min.	Do	Pains disappeared	Negative	Prostate normal
3/15-24	40 min.	Do	No complaints	Negative	Prostate normal
3/25-4/2	40 min.	Do	No complaints	Negative	Prostate normal
4/3-10	40 min.	Do	No complaints	Negative	Prostate normal
4/11-14	40 min.	Do	No complaints	Negative	Prostate normal

Patient dismissed on April 15, 1936. Patient stated pains in back and rectum had completely disappeared and that his health was much improved—impotence still present. Final examination of this patient by Dr. Pfannebecker and myself revealed prostate normal in size and condition.

ILLUSTRATIVE CHART OF BACTERIOLOGICAL STUDY OF FOCI

TWENTY PATIENTS NUMBER OF ORGANISMS FOUND IN THE ORIGINAL BROTH CULTURE				
Patient	Nose	Throat	Feces	Urine
C. A. ....	3	3	Many	0
P. A. ....	3	2	Many	2
G. B. ....	2	3	Many	2
H. B. ....	3	2	Many	1
E. C. ....	3	2	Many	1
S. C. ....	3	2	Many	1
J. E. ....	2	3	Many	1
L. F. ....	3	2	Many	1
L. F. ....	2	3	Many	0
E. G. ....	3	2	Many	3
P. H. ....	2	3	Many	1
R. H. ....	3	2	Many	2
G. H. ....	3	2	Many	0
O. I. ....	3	2	Many	2
H. M. ....	3	2	Many	1
I. R. ....	2	3	Many	2
M. R. ....	2	3	Many	1
M. ....	2	2	Many	0
S. G. ....	3	3	Many	1
D. K. ....	2	3	Many	0

NUMBER AND KIND OF ORGANISM FOUND BY THE PATHOGEN-SELECTIVE METHOD

Nose	Throat	Feces	Urine
1-Staph	1-Strep	0	0
1-Staph	1-Strep	0	1-Strep
0	0	1-Strep	0
1-Staph	0	0	0
1-Staph	1-Strep	1-Strep	1-Strep
0	0	1-Strep	0
0	1-Staph	0	0
1-Staph	0	0	0
0	0	0	0
0	1-Strep	0	0
1-Staph	0	0	1-Staph
0	0	0	0
0	0	0	1-Staph
0	1-Strep	0	0
1-Staph	1-Strep	1-Staph	1-B. Coli
0	1-Strep	0	0
1-Staph	1-Strep	0	1-Strep
0	1-Strep	1-Strep	0
1-Staph	0	0	0
1-Strep	0	0	0
0	0	0	0
0	1-Strep	1-B. Coli	0
Specific Vaccines. Specific vaccines for these			

*Specific Vaccines.* Specific vaccines for these patients were prepared from the organisms obtained by this method. Eighty-one of these vaccines were standardized to the individuals in our laboratories and the patients were then returned to the physician for treatment.

Twenty-three vaccines with specified dilutions were sent to the physician without being standardized to the patients by us.

Four patients were turned over to us by their physicians *carte blanche*, and we were asked to give our vaccine as we deemed fit, and report results. Data concerning the other patients for

whom we made the specific vaccines are now being collected from the referring physicians.

The charts of the four patients are presented below:

Miss E. L., nurse, aged 25 years. Referred to us February 20, 1934, with the following story: Right peritonsillar abscess six years ago. One year later pain developed in right wrist. This pain was periodic until three years ago, when pain developed in both wrists and has been constant ever since. No other joints were involved. At that time both wrists were markedly swollen and deformed, and very painful. She was unable to hold a thermometer or to wring dressings from hot solutions.



TABLE 5. COMPOSITE TABLE FOR CASES IN GROUP I

Case No.	Symptoms and Findings	Microscopic	Diagnosis	Number of Treatments	Results	Remarks
5002	Impotence and mental depression; small, fibrous prostate—with tenderness	Negative	Prostatitis, chronic, with fibrosis	77	Fair	Symptoms much relieved; prostate unchanged
5010	Pains in rectal area, tired feeling; piles; prostate enlarged and boggy	Gram positive diplo.	Prostatitis and vesiculitis—on an old venereal basis	84	Excellent	All symptoms gone; prostate normal, smear negative
5041	Pains in rectum, impotence; prostate soft, enlarged and very tender	Negative	Prostatitis, low grade, with vesiculitis	84	No marked change	Symptoms only partially reduced, no marked change in condition of prostate
5076	Pains in back, dripping of urine, constipation, impotence; prostate enlarged, very soft; vesicles tortuous	Negative	Prostatitis and vesiculitis, chronic—origin undetermined	49	Fair	Patient dropped treatment. Symptoms greatly relieved, and prostate improved moderately
5094	Back and leg pains, pain in rectum, impotence; prostate enlarged, boggy	Negative	Prostatitis and vesiculitis, chronic, on old venereal basis	84	Excellent	All symptoms except impotence gone; prostate showed marked improvement, swelling markedly reduced
5109	Nocturia, pains in rectum, bleeding piles, impotence; prostate enlarged, very soft with extreme tenderness	Negative	Hypertrophy of prostate; hemorrhoids	84	No marked change	Patient dropped treatment. No appreciable relief of symptoms. No change in prostate.
5203	Pains in rectum, run-down feeling; prostate enlarged and boggy	Negative	Prostatitis, chronic	84	No marked change	Some symptoms still present; no marked change in condition of the prostate
5217	Pains in back, heavy feeling in rectum; prostate enlarged and spongy	Mixed infection	Prostatitis and vesiculitis, chronic	84	Good	Symptoms gone; prostate normal; smear negative
5405	Dribbling of urine, weak erection, premature discharge; prostate enlarged and soft with great tenderness	Negative	Prostatitis and vesiculitis, chronic—on an old venereal basis	84	Good	Symptoms gone; prostate normal; smear negative
5498	Pain in rectum, morning drop, tires easily; prostate greatly enlarged and boggy—with tenderness	Gram positive diplococci	Prostatitis and vesiculitis, on an old venereal basis	118	Excellent	All symptoms gone; prostate back to normal size and condition; vesicles normal

5653	Difficulty in passing urine, morning drop, pain in rectum; prostate enlarged and vesicles tortuous	Negative	Prostatitis and vesiculitis, chronic, on an old venereal basis	91	Good	All symptoms gone; prostate markedly improved; vesicles normal.
5702	Pains in rectum, partial impotence; prostate enlarged, soft, tender	Negative	Prostatitis and vesiculitis, chronic—old venereal	118	Excellent	All symptoms gone. Prostate normal.
5914	Pains and full feeling in rectum, partial impotence; prostate greatly swollen	Negative	Prostatitis, chronic	118	Excellent	All symptoms gone. Prostate normal.
6060	Pain in rectum, debility; prostate spongy and enlarged—infection denied	Negative	Prostatitis and vesiculitis, chronic	70	Good	All symptoms gone. Prostate markedly improved
6407	Pain in rectum, morning drop; prostate very boggy and much enlarged	Gram positive diplococci	Prostatitis and vesiculitis, chronic, venereal origin	77	Good	All symptoms gone. Prostate improved. Smear negative.
6814	Pains in rectum, loss of appetite; prostate enlarged and spongy	Gram positive diplococci	Prostatitis, acute—of an undetermined origin	84	Excellent	All symptoms gone. Prostate normal. Smear negative.
7160	Pains in rectum, morning drop, partial impotence; prostate soft and enlarged	Gram positive diplococci	Prostatitis and vesiculitis, acute—on an old venereal basis	84	Excellent	All symptoms gone. Prostate and vesicles normal. Smear negative.
7203	Painful urination, steady fullness in rectum; prostate enlarged and very tender	Mixed infection	Prostatitis, sub-acute—on an old venereal basis	118	Excellent	All symptoms gone. Prostate normal, tenderness gone. Smear negative.
7335	Dragging down pains in thighs, morning drop, prostate very boggy and much enlarged	Gram positive diplococci	Prostatitis, acute—origin undetermined	84	Excellent	All symptoms gone. Prostate normal. Smear negative.
7400	Difficulty in passing urine, pains in rectum, tired out feeling; prostate enlarged and softened	Negative	Hypertrophy of prostate, origin undetermined	77	No marked change	Symptoms somewhat relieved. Prostate unchanged.



TABLE 6. COMPOSITE TABLE FOR CASES IN GROUP 2

Case No.	Symptoms and Findings	Microscopic	Diagnosis	Number of Treatments	Results	Remarks
5057	Pain and itching in rectum, drawing down pains in groin, partial impotence; prostate enlarged and spongy	Gram positive diplococci	Prostatitis and vesiculitis, chronic—on an old venereal basis	91	Good	All symptoms gone; smear negative; prostate markedly improved
5077	Pains in back and legs, dribbling of urine, fullness in rectum; prostate large, soft—extreme tenderness	Gram positive diplococci	Prostatitis and vesiculitis, chronic—on an old venereal basis	84	Good	Symptoms all gone; smear negative; prostate greatly improved
5078	Pain and fullness in rectum, debility, mental depression; prostate much enlarged and softened	Negative	Prostatitis and vesiculitis, chronic—origin undetermined	94	Good	All symptoms gone; prostate improved
5151	Pains in rectum, partial impotence, general ill health; prostate enlarged and soft with tenderness	Mixed infection	Prostatitis and vesiculitis, chronic—on an old venereal basis	100	Good	All symptoms gone; smear negative; prostate nearly normal in size
5308	Frequent urination, constipation, lack of pep; prostate swollen and softened	Gram positive diplococci	Prostatitis and vesiculitis, on an old venereal basis	70	Excellent	All symptoms gone; smear negative; prostate completely normal
5352	Pain in rectum and back, pus discharge and morning drop of 5-month duration; prostate enlarged and very spongy	Negative	Prostatitis and vesiculitis, chronic—on an old venereal basis	91	Good	Symptoms greatly relieved; prostate and vesicles normal
5445	Dragging down feeling and pains in groin, morning drop, pain and itching in rectum; prostate very large and softened	Negative	Prostatitis and vesiculitis, chronic—on an old venereal basis	105	Excellent	All symptoms gone; prostate normal
7980	Pains in back and rectum, impotence, pains worse while on feet; prostate hardened and slightly enlarged	Negative	Hypertrophy of prostate, cause undetermined	54	Excellent	All symptoms gone; prostate normal
8028	Fullness and pain in rectum with itching, debility; prostate soft and large	Pus cells few bacteria	Prostatitis, acute—on a venereal basis	54	Good	Symptoms markedly relieved; smear negative; prostate normal size

8123	Pains in rectum, partial impotence; prostate enlarged and boggy	Negative	Prostatitis, chronic, with vesiculitis—old G.C. inf.	60	Good	Symptoms markedly relieved; prostate and vesicles markedly improved
8200	Pains in rectum and back, impotence; prostate enlarged and softened	Mixed infection	Prostatitis, chronic, on an old venereal basis	54	Good	Symptoms much relieved; smear negative; prostate greatly improved
8400	Pain and tenderness in rectum, whitish discharge; prostate enlarged	Negative	Prostatitis, acute—origin undetermined	60	Good	All symptoms gone; prostate improved
8459	Drawing down pain in groin, pains in rectum; prostate large and spongy	Mixed infection	Prostatitis and vesiculitis, Chronic—probable venereal	54	Fair	Symptoms much relieved; smear negative; prostate reduced but still tender
8521	Fullness and pain in rectum; prostate swollen, softened, extremely tender	Negative	Prostatitis, chronic, of undetermined origin	54	Good	Symptoms all gone; prostate improved
8709	Fullness and pain in rectum, pains in groin; prostate much enlarged, soft	Negative	Prostatitis, chronic, vesiculitis on left side	60	No marked change	Symptoms somewhat relieved; no marked change in condition of prostate
8923	Pains in rectum and groin, failing in health; prostate hard, slightly enlarged, very tender	Negative	Prostatitis, chronic, origin undetermined	60	No marked change	Symptoms somewhat relieved; tenderness and hardness of prostate improved
9000	Pains in rectum and back, whitish discharge; prostate swollen, soft	Gram positive diplococci	Prostatitis, acute—on a venereal basis	42	Excellent	All symptoms gone; smear negative; prostate normal in size
9204	Pain and itching in rectum, whitish discharge in morning; prostate very tender, much enlarged, boggy	Gram positive diplococci	Prostatitis, acute—on a venereal basis of several months' duration	54	Excellent	All symptoms gone; smear negative; prostate completely normal
9521	Pain and itching in rectum, partial impotence, failing health; prostate large and softened	Negative	Prostatitis, chronic—origin undetermined	60	Fair	Symptoms much relieved; tenderness in prostate gone, swelling reduced
9888	Fullness and pain in rectum, morning drop, difficulty in urination, prostate moderately enlarged, spongy	Negative	Prostatitis and vesiculitis, chronic—on an old venereal basis	84	Excellent	All symptoms gone; prostate back to normal size; tenderness all gone.



By the pathogen-selective method, a staphylococcus albus was recovered from the nose, and a streptococcus hemolyticus from the throat. Vaccines were prepared from each organism and were given alternately every 3-4 days until each was standardized to the patient. Then these were combined in the proper proportions and given once per week for one year. At the end of one year, most of the pain had disappeared, and hands and wrists were much stronger. The time interval was lengthened to two weeks, and treatment continued for six months. Then the time interval was changed to once per month. On November 17, 1935, she was dismissed. Her last visit was March 23, 1936. She has no pain, can use hands normally, and is doing all routine work required of nurses.

Mrs. H. E. H., housewife, aged 30 years, was referred to us August 22, 1933, with the story that at the age of eighteen she had fallen and injured her right hip. Five months later pain developed in the hip. At the age of nineteen she came to the United States. She married at the age of twenty-three. About this time pain developed in almost all of her joints. She attributed this pain to our damp climate. She became pregnant in 1928, and all arthritic symptoms disappeared. She was totally free of arthritic pains for eight months after delivery. By the ninth month postpartum, pain developed in the spine, and soon thereafter all joints became involved. She had to give up her household duties because of pain and weakness. At the first visit her feet were so swollen and painful that she had to wear old shoes with many slits throughout. Wrists, knees, and ankles were beginning to show deformities.

By the pathogen-selective method we isolated a streptococcus veridans from the throat. A vaccine was prepared, and she received injections twice per week for eight weeks. At the end of eight weeks the swelling had gone from the feet. All joints were more relaxed, and she had a greater range of motion. The time interval was increased to one week. She became pregnant in March, 1934, and was given an injection once per month until the end of the eighth month. She was delivered in November, 1934. She then returned to us for treatment, December 14, 1934. No symptoms were present, but she was advised to come every two weeks for winter and spring. On June 3, 1935, she was dismissed and instructed to return in the fall. She returned August 8, 1935, with some pain in one toe. She was given an injection every other week for four doses, and then dismissed with instructions to return if symptoms developed. She returned March 26, 1936, because of a little stiffness in shoulders on arising in the morning. She was given one injection.

The baby is now eighteen months old. There has been no return of true arthritic symptoms. She has cared for the baby alone, does all her household duties, and is living a typical normal life of the average housewife.

Mr. M. O., truck driver and buyer for meat packer, age 35 years. In and out of refrigerator many times per day. Referred to us May 31, 1934, complaining of pain, weakness and limitation of motion in left shoulder. This condition had been present for three

years. He had had to lay off from work occasionally, and had been unable to dress himself.

By the pathogen-selective method, we isolated a staphylococcus albus from the posterior nares. A specific vaccine was prepared, and he was given an injection once per week for two months. The pain had now practically disappeared, and strength was returning to the muscles of the shoulder, hence on August 2, 1934, he was instructed to come every two weeks. On September 27, 1934, he went on a buying trip and returned to us November 11, 1934. His shoulder had given no trouble, but he had developed a slight pain in the left heel, during the past twenty-four hours. He was given an injection and instructed to return when and if symptoms returned. We saw him January 3, 1935, January 10, 1935, March 21, 1935, June 6, 1935, and February 4, 1936. His last visit was March 10, 1936. He is now working every day. Can dress himself and has normal use of his shoulder with only an occasional pain preceding a storm.

Mrs. J. P. V., housewife, aged 52 years, was referred to us November 8, 1934, complaining of pain in both knees, both ankles and the right foot. This pain began four years ago. Three years ago pain began in the left hip, and for the past two years, both hands and wrists had been painful and swollen. She had grown progressively worse, and was unable to do her own housework. Could scarcely get up and down stairs. Was awakened nightly with severe cramps in feet. The grip of the right hand was about 35% normal, and the left about 50% normal.

Staphylococcus albus was isolated from the nose by the pathogen-selective method. Standardization of the vaccine was begun November 19, 1934, and she was given two injections per week for six months. By this time her general condition was much improved and the interval between treatments was lengthened to one week. On July 19, 1935, she reported that she had walked around nine holes of golf. In October, 1935, she was instructed to come every two weeks, and in January, 1936, instructed to come once per month. Last visit, March 26, 1936. She now sleeps all night without cramps, and she negotiates three flights of stairs with ease. Goes on shopping tours for entire day. Is doing all her housework. She was dismissed with instructions to report once or twice per year.

*Conclusions:* 1. Original cultures may fail to isolate the specific germ in some patients with chronic arthritis, whereas by making use of the pathogen-selective method, the patient's whole fresh blood may inhibit the growth of non-pathogenic bacteria, thus allowing the etiological organism to grow out in pure culture.

2. If no organisms are isolated by the pathogen-selective method, it is probable that said focus is not giving rise to the joint symptoms.

3. Two of the patients whose charts are given (Mrs. J. P. V. and Mr. M. O.) were given vaccines made only from staphylococcus albus.

Both patients made satisfactory recovery. This fact would suggest that organisms other than streptococci may be responsible for some cases of chronic arthritis.

4. Conclusions relative to treatment cannot be drawn from a series of only four patients, but in view of the fact that all four showed a practical return to normal after years of progressing disabilities, we feel justified in recommending the method. Further, we feel justified in predicting that if such a study is made, and specific vaccine treatment started early, much crippling deformity may be prevented.

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### REPERCUSSION THERAPY

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Since the beginning of x-ray research secondary radiation has presented a never-ending point of interest and a many-sided question for investigation. In radiography the problem has been in eliminating the effect of its soft radiation and in radiation therapy we have been interested in its utilization and in the consideration of its influence in the ultimate biological effect.

In the fields of physics and chemistry there have been recurrent if not actually unbroken studies of the physical-chemical and photochemical effect of x-ray bombardment of almost innumerable substances. In 1903 Kunz and Baskerville<sup>1</sup> published a study of fluorescence experiments on 13,000 minerals in the American Museum of Natural History. Even before this, incomplete or hypothetical reports had been made by Thomas Edison, J. J. Burbank, Arnold, Precht, Weidmann, and others.<sup>2</sup>

My first publication dealing with secondary radiation was in 1918.<sup>3</sup> At the time I did not know that certain head shadows I was describing were due to secondary radiation from a poorly designed plate holder. This was brought to my attention in a reply article by Dr. Sherwood Moore<sup>4</sup> who had had a similar experience. This somewhat embarrassing episode so impressed me with the possibilities of secondary radiation that it has been constantly in the foreground of study.

The development of the Bucky diaphragm and refinement of instruments and technique have about eliminated secondary radiation as a radiographic problem.

The study of depth dose, distribution of intensity, iso-dose curves, relation of wave length to biological effect and other phases of the therapy problem in relation to transmitted, absorbed and broken radiation have contributed greatly to our appreciation of secondary radiation questions. But even with all that has been done our conception of the possibilities in the utilization of secondary radiation is still slightly hazy and the work is incomplete.

The phase that carries the greatest challenge to research is in the study of increased secondary effect by injection of x-ray sensitive material into the bloodstream or the tumor mass. This form of possible secondary radiation I have called repercussion radiation to distinguish it definitely from the normal secondary produced in the body tissues when under x-ray influence.

That there is a considerable interest in this project is shown in the publications and in the unofficial reports of the studies of many investigators.

In London at the Cancer Hospital W. V. Mayneord<sup>5</sup> has investigated the idea from a physical-chemical viewpoint with these conclusions:

A. The particles of secondary radiator must be small to avoid internal absorption, i. e., in the particles themselves. Radius certainly  $<10\mu$ .

B. Only moderately heavy or very heavy metals seem likely to be useful as secondary radiators.

C. There is an optimum region of wavelength to be used if such a metal is employed.

D. Amounts of heavy metal of the order of 1 mg. per cubic centimeter of tissue are required to produce an appreciable effect.

E. The secondary  $\beta$  radiation which alone is effective owing to the small amounts of radiator possible, is almost completely absorbed by thickness of tissue of the order of  $50\mu$ , and it is therefore essential that the secondary radiators be brought into very intimate contact with the cells to be affected if any effective increased dose is to ensue.

At the University of Minnesota Stenstrom, Lohmann,<sup>6</sup> and Nurnbarger<sup>7</sup> have made ex-

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haustive study of the photo-chemical changes in methylene blue under x-ray influence.

In the Smithsonian Institute Florence Myers located the wave length of ultra-violet most destructive to algae in the radiations most nearly approaching the x-ray band. At the University of Pennsylvania Drs. McDonald and Alexander have attempted to kill bacteria by the photo-chemical change of normally harmless compounds energized by x-ray.

University of California's Professor Lepeschkin killed yeast cells in a dark room by x-radiation. The cells gave off a demonstrable short wave fluorescence before dying.

These and other rumors and reports are mostly corollary to the question of repercussion radiation. Where definite work in this field is going on there seems to be an impenetrable wall of secrecy and the constant hope of finding a perfect repercussion or injection material.

This has generally been approached by injecting a solution which is supposed to have an affinity for cancer cells into the blood stream and then radiating the tumor mass. This has not been successful in any degree.

The injection of radium emanation and radioactive substances into the blood has been used with results ranging from nil to annihilation.

The injection of colloidal lead, gold and other heavy metals has proven useless.

Cancer cells are only modifications of normal tissue cells and it is rather improbable that they will take anything out of the blood stream in a sufficiently greater proportion than normal cells to prove effective in their destruction.

In Mayneord's trustworthy observation that this radiation will be absorbed in  $50\mu$  of tissue we find the basis for hypothecating an ideal repercussion.

To be effective for repercussion radiation the material which is to produce this radiation must surround and be in contact with the individual cancer cells. This can be accomplished only by introducing the material into the tumor mass directly.

First and foremost it must be a substance which upon exposure to x-ray will give off a radiation in the range of very long wave length x-ray. The nearer the wave length or quality approaches that of ultra-violet the better.

It must have a low toxicity when absorbed and carried into the general circulation as it may be

necessary at times to use relatively large amounts.

It must be a true solution or a very dilute colloid suspension as repeated trials with the colloids of several heavy metals have shown that they do not infiltrate evenly and sufficiently among the individual cells and that they are mostly coagulated or precipitated by the body chlorides.

It must not be absorbed too rapidly as this will carry it away from the tumor mass before the radiation takes place.

It must not be extremely irritating if successful without general anesthesia.

To summarize these qualities the repercussion must be a non-irritating, non-toxic, true solution that is absorbed slowly and produces a large amount of secondary or percussive radiation when exposed to x-ray.

H. S. Newcomer<sup>8</sup> of the Henry Phipps Institute of the University of Pennsylvania published in 1920 the report of his studies on x-ray fluorescence of certain organic compounds. His tables contain the radiation reactions of several hundred organic and inorganic compounds and are a valuable reference for anyone interested in secondary radiation. But most valuable were his conclusions. He found that most fluorescence was in the violet field extending into the blue and green and, therefore, useless for practical consideration in this field. Limited at that time by inadequate instruments he was unable to determine fluorescence below  $2000 \text{ \AA}$ . The greatest fluorescence was found among inorganic compounds.

His most important finding was that the quality or amount of fluorescence could not be predicted with any relation to the combined qualities of the component elements and that no results could be classified on a basis of chemical structure. He reaffirmed the observation of Kunz and Baskerville that there is no rhythm or reason in behavior of various chemical combinations and that physical state also changes the quantity and quality of radiation as seen in the varying reactions of chemically identical minerals found in different physical states.

In view of these unchartable reactions and the unpredictable results of x-ray effect it is only natural that many physicists and chemists believe the clinical application of repercussion radiation an impossibility. Through the advice

and encouragement of Professor George L. Clark of the University of Illinois the laboratory and clinical investigations of many possible repercussive agents were carried on.

For the laboratory experiments a strain of healthy white rats was selected and all work has been done with this one strain in order to keep background conditions as nearly uniform as possible. Rats that had been implanted with the Flexner-Jobling rat carcinoma were obtained through the courtesy of Dr. Francis Carter Wood at the Columbia University, Institute of Cancer Research. The cancer tissue was removed from these rats, ground up and injected in the inguinal region of three ounce white rats. Usually from twenty to thirty were injected at one time. When the growth had reached about the size of a hazel nut the trials with the repercussive compounds were made. Before any of the compounds were injected into the tumor tissue, normal, healthy rats were injected with the repercussin in order to test the toxicity of the compounds. As the non-toxic compounds were selected the repercussin tests were made. Usually these were grouped in sets of three: Rats with tumors as nearly the same size as possible were selected; one would be injected with the repercussin but not radiated; the second would be injected and radiated with a fixed amount of x-ray and the third was radiated with the same amount of x-ray without injection. These rats were marked and kept in the same cage under identical conditions. Naturally many of the earlier tests showed but little difference in behavior of the two radiated rats; both would show the same amount of retardation of the growth, sometimes with a complete cure and at times one or the other might develop further growth and be granted euthanasia.

After eight months of trial, colloids and combinations of colloids of heavy metals were discarded. They are rapidly precipitated or coagulated in the body tissues and cannot be infiltrated among the cells. Colloids gave place to a series of benzene derivatives and these to a series of unrelated organic compounds. Early in 1934 attention was turned to salts of heavy metals. Of course there is no end of these and our only encouragement came from some of the simplest. Nearly all were absorbed too rapidly when used in aqueous solution and could not be retained long enough to permit sufficient radia-

tion. Relative toxicity gave considerable trouble. Amounts sufficient for repercussion trials were injected into normal rats to test for toxicity and local irritation.

It must be noted that there is a vast difference in proportion of mass between a fifteen millimeter tumor and the body of a rat and the same size tumor and the body of a human subject. A dose that might be slightly toxic for a rat would be negligible when given to a human subject.

With the promise of usable results various solutions and amounts of sodium bromide were carried through several series of tumor rats. Sodium bromide has a fluorescing secondary with wave lengths between 5000 and 2400 Å with a band of diminishing intensity at 4000 Å. At 2400 Å it is well within the range of true ultraviolet and constitutes a destructive phase of radiation.

Concentrated solutions of sodium bromide are extremely irritating when injected and are absorbed rapidly. In making the animal experiments a local anesthetic of procaine and adrenalin was injected first and after five minutes for absorption to be complete the bromide injection was made with the animal in position at the x-ray tube and radiation was started immediately. In the later experiments we used solutions containing 0.6 grams sodium bromide per mil in a 3% acacia suspension. The acacia was added to retard absorption. The tissues being partially exanguinated by the adrenalin also added to the delay of absorption. For each calculated cubic centimeter mass of tumor 0.1 mil of the solution was injected.

Tumors of the Flexner-Jobling type of rat carcinoma are not especially sensitive to x-rays and radium although one finds that a 2.0 cm. tumor will respond to about the same amount of radiation that would be required to destroy smaller growths. In using a repercussin in treatment one should be able to use less radiation than where no injection has been made. 2000r of unfiltered low voltage radiation will destroy most of the 1.5 to 2.0 cm. tumors. Therefore when the injection was used only 1500r of radiation was given and the question of the efficiency of the injected material was to be answered in the final result.

The tests were made on groups of from 12 to 20 rats with tumors of about the same size.



In each group at least two would be injected without radiation. Three would receive 1500r without injection and those remaining of the group would receive the bromide injection and radiation. In no group was change seen in the tumor which could be definitely attributed to the injection only. These animals continued with the tumor growth until granted euthanasia. Of those receiving radiation and no injection the tumor would usually subside and then start growing and producing metastases. With those receiving the repercussion radiation we had about 40% apparent cures.

If more x-ray had been given these animals the percentage of cures would certainly have been made during the past two years. There given to the rats not injected an equally high percentage of cures would have resulted. The one point of value lies in the more rapid action with less x-ray when the repercussion method is used.

Clinical trials in carefully selected cases have been made during the past two years. There appears to be a more rapid reaction to the radiation with earlier slough when this method of reinforced radiation is used. The elapsed time is too short, the number of cases too small and judgment may be warped too easily by one's enthusiasm to justify conclusive statistication at this time.

The apparent result may be influenced by many factors which we at present do not understand and which will be clarified only by very extensive work. The supposed repercussive radiation may be a minor factor and the photochemical reaction between the injected material and the complicated protein molecules may answer the question. This is not presented as a finished work but to arouse interest in this important possibility in x-ray therapy. I sincerely hope that some research institution may carry on from here, check up my observations and complete the investigation in this very promising field.

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#### DISCUSSION

Dr. Gianturco, Urbana: In connection with Dr. Williams' very interesting paper, I would like to mention a case that I have been following for two years. The patient, a 30 year old lady suffering from Hodgkin's disease, came to us with large mediastinal glands and enlarged liver and spleen. She was given a course of Roentgen therapy and at the end of a month the mediastinal glands had disappeared and the liver and spleen had returned to their normal size. Six months later she returned with large liver and spleen.

As the radioactivity of thorium dioxide was much publicized I thought that since this metal is deposited just in those tissues which are most affected by the Hodgkin's granuloma it might have a beneficial effect on the disease. The patient was given intravenously 50 cc of thorium dioxide sol. which at the end of three days distinctly visualized to the Roentgenogram the enlarged liver and spleen. A month was allowed to elapse but Roentgenograms of the abdomen taken at this time did not show any appreciable effect of the thorium rays upon the size of the enlarged organ.

At this point Roentgen ray therapy was resumed with the same factors used before and the decrease in the size of the liver and spleen was followed roentgenographically every ten days. The thorium imbedded in the liver and spleen must have acted as a perfectly distributed repercussor for the primary rays, but the decrease in the size of the organs occurred with no greater speed than when no thorium was present.

This case is interesting to me because, although it allows no definite conclusions, it seems to point out: (a) that the radioactivity of thorium must be quite small if it failed to affect as sensitive a granuloma as Hodgkin's; (b) that the use of thorium as repercussor of the primary Roentgen rays does not seem to increase their biological action.

Dr. Harry Olin, Chicago: I do not know much about the repercussion theory only by experimentation I had in one case some years ago of amebic dysentery. It occurred to the clinician that if the colon were injected with a solution of eosin it might be helpful; that while the patient withheld that solution to give therapy to the colon, and that it would have some immediate benefit and value to the amebic dysentery. It was purely experimental on the basis that eosin would intensify the irradiation of the roentgen ray and, therefore, be of value to the patient. We tried out about three patients with amebic dysentery and in all gave four treatments to each case with no definite results clinically in improvement of the patient.

Dr. Hilt: I am not a physicist. I wish we had a physicist with us. I think a lot is proposed on the wrong theory of depth dosage. I do not think you can get results from a physical standpoint. Maybe I am wrong but I think that is the reason you fail. They have tried it with barium and other things and have not had results. That which is absorbed can be measured. I think one will realize these more recent

materials will have little or no effect. You can apply more radiation and have the same effect. The secondary and scattered radiation will have an effect on the diseased as well as normal tissue. Any foreign substance injected will not give selective action to diseased tissue alone.

Dr. Williams (closing the discussion): I am sorry Dr. Clark is not here because in his department at the University of Illinois they are doing quite an extensive work in the line of photoelectric research, in which they are using mixtures of materials that are otherwise inert and then measuring the amount of chemical change after these materials are radiated. I do not know the exact situation but I believe Dr. Ellice McDonald, formerly of the University of Pennsylvania, is now in the new research institute of Du Pont and probably will carry on this same line.

As to the reaction of carbon dioxide, I am sorry I cannot answer the question. Dr. Clark could give that information. I believe eosin to be inert with the use of x-ray as far as any production of secondary radiation is possible.

In connection with Dr. Hilt's question relative to the measurement of the depth dose, you must remember that in depth dose you are measuring a rate of change, that x-ray is not a material, it is a force and that if you measure the depth dose at five centimeters and then at ten centimeters, you cannot subtract and get the amount of x-ray absorbed because no such thing exists. All you can measure is the rate of change of the rate of change. I can give you the mathematical formula for that if you want it.

Concerning the conclusions of Dr. Landaur and Dr. Compton, I would add to that Mr. Mayneord, Dr. Duane and other physicists. I would rather take the opinion of Dr. Regaud, a man who was a scientist and physicist and became a cytologist focusing his mind on the individual cell and what is happening to that cell. This field is just opening again. It has been opened and closed and opened and closed. I think every physicist has closed it and slammed the door but I believe clinically it is a possibility if not a probability. Personally I intend to keep on working.

## SEPSIS OF CRYPTOGENIC ORIGIN

FREDERICK STENN, M. D., and

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Despite the most careful medical analysis every clinician encounters patients with fever the origin of which he is unable to determine. Frequently, the diagnosis becomes apparent only after weeks or months of observation, and often even necropsy may fail to disclose the cause. Recognized in 1878 by Leube<sup>1</sup> cryptogenic sepsis has been reported mostly in infants and children by Turnbull,<sup>2</sup> Copeland,<sup>3</sup> Sally,<sup>4</sup> Rawlings,<sup>5</sup> Greenberg<sup>6</sup> and others. Copeland would have us

explain these obscure fevers under the diagnosis of nervous instability after all causes have been carefully excluded. Cooke,<sup>7</sup> on the other hand, states that "Cryptogenetic septicemia in which the primary focus remains hidden . . . is more frequently encountered with hemolytic streptococcus infections than those due to other organisms. It is possible that in some of these cases the portal of entry may have been the gastrointestinal tract."

Amongst the most frequent causes in childhood, as Epstein<sup>8</sup> and Scott<sup>9</sup> indicate, are febris neonarorum, congenital syphilis, rickets and scurvy, influenza, pyelitis, otitis media, incipient neonatorum, congenital syphilis, rickets and carditis, typhoid, malaria, intestinal toxemias, lymphadenitis, nasopharyngotonsillitis and sinusitis. Barbour<sup>10</sup> notes that pyelitis may be caused by ureteral obstruction in which case the urine may be negative for indefinite periods of time.

In their study of 173 children and adults discharged from the Peter Bent Brigham Hospital with the diagnosis of fever of undetermined origin Alt and Barker<sup>11</sup> discovered after follow-up examinations that the majority of these had tuberculosis, rheumatic infections, or malignancies. They found the low grade afternoon fevers often related to early tuberculosis, chronic sepsis, rheumatic infections, or malignant disease; the acute fevers to be caused by typhoid, miliary tuberculosis, tuberculous meningitis and bacterial endocarditis; and other fevers, to pyelitis, hypernephroma, Malta fever, colon bacillus or meningococcus septicemia and hepatic fever.

The following case is instructive:

Charlotte V., aged 22 months, of normal birth, and the only daughter of healthy parents, had enjoyed freedom from illness except for an acute otitis media at the age of 1 year and an occasional cold since. Breast and bottle-fed during the first year, with cod liver oil and orange juice given at 1 month, the feeding history up to present age is faultless. Her teeth appeared, she sat up, talked and walked in the usual periods of time. The parents noted, however, that she had always been pale. On February 12, 1935, the father declared that the baby had suddenly become feverish and described the temperature as being so high that a cigarette applied to the skin would burn. The baby was irritable and cried but no other symptom was present. The temperature was 106.5°; the baby was alert and appeared well; the skin, very pale, hot and dry; the eyes clear; the ear drums normal; the nasal chambers negative; the tongue coated; the tonsils perhaps slightly redder than normal; no findings in the lungs or heart; abdomen soft and slightly



distended; no palpable spleen or tender kidney; reflexes normal; no Kernig or rigidity of the neck.

The following morning the temperature was 105.5°; the baby had cried all night. Physical examination failed to point to a diagnosis. That evening the temperature was 102°, the follow day 106.8°, and on February 15, 1935, 107°. On February 16 the child was brought to Englewood Hospital, active, playful, and in a surprisingly good physical state. Dr. Henry Boettcher found the ear drums negative, but performed a bilateral myringotomy and no serum or pus exuded. The temperature assumed a septic course, rising from normal to 105, 106, 107° daily. The white blood count was 18,050; the red blood count 3,900,000, color index 0.9; hemoglobin 70 per cent.; the urine showed a very faint trace of albumin with 20 leucocytes per high power field; the stools were negative for parasites and blood. The blood was negative for typhoid, paratyphoid A and B and undulant fever; the blood smears were negative for malaria; the differential blood picture showed 29 per cent. lymphocytes and 71 per cent. neutrophils and the erythrocytes showed marked achromia; the spinal fluid Wassermann was negative and the spinal fluid showed 2 lymphocytes per cubic millimeter; the blood cultures were negative. The x-ray of the mastoids on two occasions showed no infection; x-ray of the chest showed negative lungs and the heart slightly enlarged to the left. Flat film of the kidney region showed no evidence of calculi but the distention of the small bowel and colon suggested to Dr. R. J. Maier, the roentgenologist, peritoneal infection. The diagnosis was septicemia of cryptogenic origin.

On February 19, sixty cubic centimeters of father's blood was given intramuscularly with no effect on the temperature. On February 22 and 23 fifteen cubic centimeters of antimeningococcus serum and 10 cc. of antistreptococcus serum were given intramuscularly. The temperature now reached a maximum of 104° but on February 28 the temperature shot up to 106° with chill. At this point 20,000 units of diphtheria antitoxin were given intramuscularly. The temperature continued to soar from normal to 105° daily. At the suggestion of Dr. Julius Hess, 100 cc. of father's citrated blood was given intravenously on March 6. The temperature (for the first time in 4 weeks) remained normal on March 6-9. On March 10 the child was discharged but the temperature at home began to resume its former course, reaching a maximum varying between 103° and 105°. On March 15 with a temperature of 105.2° the child was returned to the hospital and given 170 cc. of father's citrated blood intravenously. Promptly the temperature fell to normal, rising to 101° the following day by thereafter the temperature has been normal or very close to normal. On discharge from the hospital the white blood count was 10,750; the red blood count 4,300,000 and the hemoglobin 71 per cent.

Up to the time of the writing of this paper which is almost two years after discharge from the hospital the patient has been normal clinically. It is regrettable that

intravenous pyelography was omitted in the clinical examination.

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#### DIVIDENDS OF THE DEPRESSION

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It was ten years after the world war that the best and truest books dealing with it began to appear. We are now just beginning to see the great depression in its proper perspective. The things that have bulked largest when we have looked at the depression are the losses and liabilities to which it has subjected us. There are many who cannot think of these depression years through which we have been passing as anything but a major national calamity with no compensations of any kind. Nevertheless there are some assets that emerge. The depression has declared some dividends for which we cannot be too grateful. The material losses of the depression are still so close to us that it is most difficult to see things in their proper perspective. To me it is impossible to believe that from the events of these recent years that have been marked by untold financial loss and world-wide suffering we are to secure no present and lasting benefits, no strengthening of our character, no enrichment of our lives, no permanent blessings.

Notwithstanding all the evils of the depression I still believe in the goodness of God and the friendliness of the universe. God has not forsaken his world because men have lost their paper profits. An Old Testament writer once

Address, in part, given before the Englewood Kiwanis Club, Chicago.

said concerning a threatened calamity: "Howbeit our God turned the curse into a blessing." And so down through history again and again what men have thought only an evil has been divinely overruled for good. Let us look for the silver lining of the dark cloud, and we will see that dividends more valuable than gold have been declared by the depression.

*Dividends of Health.* Emerson has said: "Health is the greatest wealth." One of the surprisingly great dividends of the depression is better health. At the beginning of the depression all social workers and health experts thought that reduced incomes and the worry of unemployment would result in a great increase in morbidity and mortality rates. But to the surprise of everybody, along with the depression began a marked improvement in the general health of the nation. Even a disease like tuberculosis, often associated with under nutrition, showed a decrease of eight per cent. in its mortality rate. President Hoover called the nation's attention to this surprising health improvement at the end of the first year of the depression.

More surprising, the excellent health record persisted in 1932 in spite of the depression. Vital statistics, which are the bookkeeping of life, showed the lowest death rate since our national recording of mortality statistics began, 10.9 per 1,000 estimated population. Chicago's average death rate for 1926 to 1929 was 11.9 and in 1932 dropped to 9.75 per 1,000, notwithstanding the larger number of suicides.

Still more surprising, in 1933 our national mortality rate dropped to 10.1, the lowest in our national history. The death rate from cancer, which had increased steadily for fifteen years, was temporarily halted in 1933. Also the world-wide increase of suicides which accompanied the depression was arrested. Chicago's death rate dropped to 9.5, the healthiest year in its history. Fewer babies died than in any previous year. Our low death record is more remarkable because seven and one-half millions of people were here at our Century of Progress exposition.

It is almost unbelievable that during the fourth year of the depression Chicago continued to be one of the healthiest cities in the entire world. Deaths from tuberculosis were fewer than during 1933. A survey of 46 cities showed a decline of four per cent. in tuberculosis deaths,

the lowest yet recorded for large American cities.

Dr. Robert A. Frazer, chief medical director of the New York Life Insurance Company, said that 1934 took its place among the best years of our history. The same best years were 1931, 1932 and 1933 which, although depression years, broke all previous records of low mortality. With the gradual passing of the depression there came a slight increase in mortality rates in 1935. Both the birth rate of 13 and the death rate of 10.5 per 1,000 population were the highest in four years.

Our own national health record is not exceptional for the League of Nations' Statistical Year Book shows that in the fifth year of the depression the world death rate declined. Of 30 countries on all continents for which 1934 data are available the death rate, in all but three South American countries, was less than the average in the prosperous five years of 1926 to 1930 and in all but 13 it was less than in 1933. It may truly be said that through these depression years the health curve of the world has never fallen.

*Hospitals, Doctors and Undertakers Lament.* Our Chicago hospital records show that there has been less illness here during the depression years. Whole floors in nearly all of our hospitals have been closed for months at a time on account of lack of patients. No one who needed hospitalization has been turned away for financial reasons. Both credit and charity have been generously extended by our hospitals.

In the doctors' room there has been heard a chorus of wails about the dreadful decrease of medical practice. A cynical friend suggests that perhaps people were healthier because doctors were not so busy. Perhaps he overheard the remarks of some facetious physician. I remember a few years ago at a social function, I congratulated a good old doctor on his health and vigor at 84 and asked him to what he attributed his wonderful vitality. He pulled my head down, for he was only about five foot five, and pretended to confide a medical secret, but answered in a loud whisper: "I don't take any of my own medicine!"

Referring to the great medical nihilist, who said that if all medicines were dumped into the sea it would be better for men and worse for the



fishes, I have admitted that in spite of taking some medicine I have not missed a full day's professional duties on account of illness during more than fifty years.

Not only the doctors but also those so-called "followers of the medical profession"—the undertakers—at a recent national meeting of their association, raised loud complaints and became regular Rooseveltian "calamity howlers" about the dreadful falling off in their funerals.

*Depression Does Not Boost Insanity.* Perhaps you are now willing to concede that there were fewer deaths during the depression, but you say: "Think how many were driven to insanity." Strange to say, a medical statistical study of the hospital records of a large number of cases of psychoses and psychoneuroses showed a smaller percentage of cases of mental illness caused by economic troubles during the depression than during the so-called luxury years.

Dr. Rotman, director of the Chicago Psychopathic Institute, reported in 1935 that the number of mental cases remained virtually stationery during the depression. There was no increase in insanity due to the depression. It may have produced more borderline states or what we call psychoneurotics and the lay public calls extreme nervousness, but no increase of psychotics or insane is apparent.

Dr. Gerty, superintendent of the Psychopathic Hospital, said that there may be more chronic cases in state institutions because their relatives are less able to care for them, but there are not more new cases committed. He reported that during the first four years of the depression there was a decrease in the number of patients in the Psychopathic Hospital, and whimsically said: "I think there were more 'crazy' persons during the boom period—who didn't know it, of course."

It is true that the mental depression that leads to suicide reached its nadir in 1932 when such fatalities were the highest on record. There were many to whom financial success had come easily and had never learned how to "take it on the chin." The easiest way out was a drop from a fifteenth story window.

As an old collegiate football and tennis player and amateur golfer I have always believed that we are prepared for the game of life by our defeats as well as by our victories. In fact, it

often requires more sportsmanship to be a good loser than to be a winner. This thought suggests that there are not only physical, but also mental, moral and spiritual dividends of the depression that are still more valuable and which may lead some future historian to write: "It was a blessing in disguise."

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## PHYSICAL PAIN AND MENTAL SUFFERING IN WORKMEN'S COMPENSATION CASES

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An employee had been injured by a fall while lifting on a machine, suffering a badly wrenched back and a swelling in the groin. In due time the insurance carrier had stopped payment of compensation upon the ground that claimant's disability had ceased, and that he was able to return to his former occupation. Claimant resisted.

Before the Commission the employee testified that an operation had been successful, but that his kidney pained him continually, that he had attempted in vain to work at his former employment, but that he had been forced to seek lighter and other work.

The remaining trouble was thought by medical experts to be purely mental. A large neurasthenic element was believed to be responsible therefor, since the employee had shown a decided tendency to be dissatisfied with the medical care. He had been discharged from the hospital "in order to aid him in getting the right onlook on life."

Manufactured symptoms, exaggeration of those being present, their false interpretation by the claimant, his morbid introspection in regard to the future, his lack of courage and energy to throw off his mental trouble, the tendency to be querulous, and particularly the great obstinacy with which these conditions resist any attempt at cure—all these factors put the insurance carrier upon his guard as to the genuineness of the physical pain and mental suffering.

There is a difference between malingering and similar states of mind in which the elements of

complete, intentional and conscious simulation are missing. Thus, a hysterical woman who claims that she cannot bear the slightest touch and then hardly feels the strongest pressure when her attention is diverted would hardly be called a malingerer by any physician. A similar thing occurs in accident neuroses, since there are analogous conditions.

The industrial injury lays the foundation for the employer's liability. However, pre-accidental facts may have some value in estimating the good faith of the workman. Lack of symptoms of any nervous trouble prior to the fortuity together with a sufficiently serious trauma likely to incite a neurosis supports somewhat the inference of an honest claim.

The proved existence of a preexisting infirmity may have more than one meaning. Claims based upon ailments, alleged to have become aggravated by the accident, are not necessarily fraudulent, when the intensity of the nervous trouble is at issue. The disease may have been slight and slow in its progress as long as left to its own course. Natural remissions, or medical treatments, may have kept the patient in comparatively good health. There may have been little or no mental suffering or physical pain.

On the other hand, a workman may have carefully studied the symptoms of his preaccidental ailment with a view of utilizing his knowledge in a litigation to come so as to obtain inequitable compensation benefits. Or, there may have been fraud in making a claim in another litigation so that from such circumstance one may infer wilful and intentional exaggeration in a proceeding involving a truly industrial injury.

Other facts may help in fastening bad faith upon the claimant. He may belong to a class of people who are more likely to be afflicted with a certain preexisting nervous malady than other persons. The conclusion of suffering, or its intensification, by reason of the employment, thus may become weakened or even refuted. Nationality and race exert some influence. Individuals of Nordic extraction, for example, are said to be less subject to hysteria than those of the Jewish race or the French. Whether the station of life should be given any weight, however, appears to be doubtful, though it has been asserted that women of the higher classes are more prone to

exhibit signs of hysteria than those of the lower walks of life.

Regardless of the question whether or not there is a preexisting disorder, the post-accidental events throw some light upon the evaluation of good or bad faith. The intensity of the morbid changes in the nervous system may be accounted for by some physical lesion of the brain, spinal cord, or peripheral nerves. An anomalous structure may have formed. Complications may have set in so as to cause a considerable drain of nervous energy. Or, nervous suffering may be explainable as a manifestation of the transitory stage between complete physical recovery and the adjustment by the corresponding brain cells to the new state of health. Here, medical science establishes fairly well the good faith of the claimant.

In other cases there is no detectable pathology. This lack of objective findings is avidly taken up by the defence which contends that there is the intervention of a new and independent cause, represented by the patient himself, who thus breaks the continuity of the chain of events and frees the employer from liability *pro tanto* or *in toto*.

Unfulfilled desires in our large social existence, unrelated to work, personal wishes of success, when thwarted by the employer or otherwise, inability to advance one's position all lead to resentment towards industrial enterprises. The accident is only the fuse which causes these ungratified wishes to transform themselves into a psychoneurosis. There may have been a discharge from the employment after the accident. Anticipation of injury arises out of working among dangerous machinery. Psychic contagion is a contributing factor. Accident neuroses amongst employees of corporations are said to be uncommon in comparison to the frequency amongst injured "outsiders."

The workman acquires the feeling of insecurity and fear; there is subconsciousness of potential future litigation involving his own injuries. The desire to escape industrial hazards by means of compensation may become a veritable complex, though at first hidden from its victim. This "covetous wish" ought not to be compensated, as to do so would lead to a perversion of compensation legislation.



In other cases a "desire neurosis" develops. The employee thinks he is entitled to large damages. He nurses the conviction that social injustice has been done to him with a chance of now getting even. And the more difficult it is for him to barely support his family, the greater the desire for compensation. Expectation of gain, worries of litigation, the suggestions of physicians and the insinuations of lawyers serve to keep alive these mental processes.

Autosuggestion plays a role. The congratulations of sympathetic friends concerning his fortunate escape from more serious consequences induce the patient to develop in his imagination his suffering to a point where his slight pain becomes now very uncomfortable. He becomes restless, he cannot sleep and soon exhibits the picture of a complete emotional breakdown.

It may happen that the employee takes stock of the different states of mind he is going through, and that he recognizes the fallacy of his self-deception. The attitude of courts towards such an employee when aware of his self-imposition is, however, not uniform. In some jurisdictions only actual malingering will defeat. In others proof of intentional and wilful practices and of use of mental processes by which mental and physical infirmities are developed into injurious conditions is sufficient to deny awards, even though there is no actual intent to deceive. Another standard of compensability is that the workman must have an honest, fixed, definite and continuing belief that he is suffering from severe bodily pain, and that he is in such a disordered condition that he is unable to work. Consequently, bad faith in the employee originates when one single thought only is expressed in words or acts thus indicating that this fixed and continuing belief is interrupted by doubt.

Brooding over the effects of the injury has been held not to be compensable in a British case. But, worrying and starving so that death results was in Massachusetts held not to be fatal to an award. The fact that the employee has not sufficient will-power to throw off his troubles does not exclude good faith in absence of some evidence of wilfulness. However, "litigation neurosis," according to a New York decision, is not a part of compensable injuries.

Words and acts of the employee must establish the fact of bad faith. Being able to drive a car, when a patient is fitted with a brace, does not suggest fraud per se, particularly when the patient has been carrying himself in the same stooped position over a period of months.

Even the fact that the workman does not complain immediately after the industrial calamity does not impeach his good faith. Nervous disorders of the sort under discussion do not come on contemporaneously with the accident, or immediately thereafter. But, if they do, their causal connection with the employment is questionable to a high degree. It is, therefore, not absolutely a suspicious circumstance that the employee continued to work for a while, or that he seeks the aid of the commission after having made a settlement.

The theory is that the workman's ability to earn a livelihood must be restored as far as possible to its preaccidental state in order to warrant discontinuance of compensation. Judging from an Illinois decision, surgical or medical treatment, if inefficient to cure the physical pain or mental suffering, should be superseded by mental suggestions, psychotherapy, Christian Science, or mental cults of whatever description. Proof of cure of the bodily ailment, a practice not uncommonly indulged in by insurance companies in attacking the good faith of the workman, would then be insufficient to infer fraud, actual or constructive. But even when psychotherapy has been used without success, no bad faith should be presumed from mere bad results. The task of reeducating such patients may require much time and may be futile nevertheless. If mental treatment is of no effect, the burden must be borne by industry rather than by its individual servants.

In the opening case the employee's mental attitude was a part of an injury arising out of the employment. From the dissatisfaction with the medical care one might possibly infer bad faith. Yet, there were attempts at work. The operation left some nervous impairment. Finally, doctors expressly excluded malingering. The order of the Commission that further payments of the full amount of compensation be made, was reversed with directions to grant a smaller sum, since the claimant had not yet recovered fully.

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## PRESENT STATUS OF IMMUNIZATION AGAINST CONTAGIOUS DISEASES

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In discussing immunization it at once becomes apparent that we must consider the result we hope to obtain, immunity.

Immunity is that defensive force of the body which protects against the ill consequences of infection.

Infection is the entrance into the body and the development of pathogenic consequences of bacterial invasion.

Bacteria then, to cause pathogenic consequences, must be of the proper strain; they must have proper selectivity, be in suitable numbers, have adequate resistance, be capable of rapid multiplication, and of high virulency; the intensity of the infection depending, of course, upon the variance of the above factors.

The strain of bacteria will, in most cases, determine the selectivity. Different strains of the same bacteria vary in their selectivity and therefore cause different diseases, as we now classify them.

Bacteria, to be effective, must be contacted in suitable numbers and the number contacted determines the initial dosage. Bacteria must have an adequate resistance to withstand the fight of the defensive forces of the host and the greater this resistance the more severe and prolonged will be the illness.

Virulency, or fighting ability, of the bacteria is an important factor as regards the outcome of the infection and probably has more to do with toxicity than any other single factor.

Bacteria, to be potent, must also have a strong invasive power, or adept quality of gaining admission into the blood-stream.

Should an individual become exposed to bacterial contamination he, himself, may not become contaminated but if he does the consequences depend first upon the "invasive power" of the organism. Should this invasive power be low he will either become a carrier of the organism, for an indefinite period of time, or he will develop only a mild, local infection; i. e., as an inflamed throat. If the organism has a high invasive power he will develop anything from a local condition to a severe systemic disturbance,

depending upon other qualitative factors of the organism.

On the quantitative side, contamination with a few bacteria does not constitute the dosage of many bacteria and so the consequences of such an infection should, from the bacterial point of view, be light or nihil. Should the contamination be quantitatively low but with high invasive power, resistance, virulency and ability of rapid multiplication, then the consequences depend entirely upon the defensive forces of the host. Thus must we consider infection on both a qualitative and a quantitative basis.

The virulence of the organism must be determined by the quantity and quality of toxin it produces in the host and also upon its ability of rapid multiplicity and penetration of the body defenses. Toxins must be liberated faster than antitoxins are formed; multiplication must be more rapid than the natural death rate of the organism.

True virulency depends upon the ability of the organism to secrete and excrete substances which are toxic to the human tissues. Exotoxins are such substances; they are extra-cellular and usually give rise to symptoms only after a period of incubation. Endotoxins are thought to be products of cell disintegration but may be obtained by cell extraction. Some bacteria, such as the streptococcus, are said to be virulent because of their ability of rapid multiplicity, and that they overwhelm the host with disintegration products and neutralization of the body defenses.

Immunity, as generally accepted, means the resistance of an individual through his body defenses to infection and is of two varieties: i. e., general and specific.

*General immunity* is usually inferred when we speak of the individual's "resistance." The factors in immunity are, for the most part, however, usually specific except those offered by healthy mucous membranes, and the effects of body chemistry as it relates to the secretions. General immunity, as it relates to infections in general, is probably a factor in the severity and duration of illnesses and is of import in rapidity and completeness of recovery. Thus we speak of high or low resistance of an individual, meaning degree of susceptibility to infection in general as it pertains to his general, body functions. Wherefore, we are dealing with physical chemistry and not with antibodies, antitoxins or anti-



gens. If we are attempting to build up resistance, or general immunity, in the host we must use general agents to accomplish our purposes, but should we attempt specific immunity we must then resort to specific agents which we know will immunize to specific infections or bacteria.

*Specific immunity* means body defenses that protect against certain types of infection, or against typical strains of bacteria which always cause like consequences in different hosts. Specific immunity may be generally classified as natural and acquired.

*Natural immunity* is that defense which nature bestows upon an individual or race through, perhaps, many causes and which are usually unknown. Most children are, at birth, immune to many infections and this may last for a few weeks or months only or it may endure into later years or throughout life. We do know that it is usually not permanent. In the newborn natural immunity is thought to be transmitted through the blood of the mother, particularly if her bloodstream contains those protective substances necessary to produce immunity. This type we designate as congenital immunity. It is possible that the mother's milk, in breast feeding, also carries the immune substances to the child, providing the mother is also immune. This, I believe, explains why the average infant, during the first year of life, is immune to diphtheria, measles and other of the contagions.

Race also has a strong influence on natural immunity as certain races seem well protected against certain infections while others, having a low degree of natural immunity, succumb rather rapidly. Possibly living conditions, location, food and lack of contact may be partially the answer.

*Acquired immunity* interests us most as physicians in that it is a practical means of reducing morbidity and in many cases preventing mortality. It offers the means, though neglected, of enhancing the value of preventive medicine and it is the duty of every practicing physician to give it more heed. At the present time it is, unfortunately, applicable to only a few of the more dreaded infections but in time the scope of this field of medicine will widen. Acquired immunity may be produced either passively or actively.

*Passive immunity* is artificial, usually immediate, of short duration; is accomplished by inoculation with large doses of antitoxin and is

directed toward a specific infection. It reaches its height of protection within a few hours and then gradually, through the eliminative processes of the body, loses its potency and after two or more weeks the individual returns to the susceptible status. The antitoxin acts merely as a temporary protective substance while in the body, diminishes rapidly as a defensive force and does not stimulate the body forces to increased production of protective substances.

*Active natural immunity* is induced by the contraction of certain diseases as measles, scarlet fever, chickenpox or smallpox and while this immunity is practically always complete and lasting there are instances where it is only partial and of indefinite duration. This may be due to the infection or it may be due to the reaction of the host, or to both. Again the individual may contract the infection, may not react sufficiently to become ill or even show any typical, clinical symptoms and develop either a complete or partial immunity. If the immunity is complete it may be permanent and protect against further occurrence of the disease; or the complete immunity may be lost entirely or become partial, in which case chance will determine freedom from a repetition.

While some infections do confer immunity, either complete or partial, many do not do so but rather increase the susceptibility, as for example pneumonia, influenza, tonsillitis and the common cold. Active natural immunity, it is thought, may be produced by either large or small, frequent doses of a virulent bacteria and this we call *relative immunity*.

*Active artificial immunity* may be produced by either active or inactive cultures, or by some product of the bacteria. In some cases immunity to a disease may be produced by the products of bacteria, or the bacteria themselves, which are responsible for, or the causative agent of, another disease. Active artificial immunity is the type which falls within the physician's province to administer. It is the type that can, and should, be produced before infection is contacted. It is produced by inoculation of the susceptible host with some product of the infective organism whereby the body defenses are stimulated for the production of antibodies. As contrasted to passive immunity which is used for immediate and temporary protection, active artificial immunity is produced as a slow but lasting protec-

tion. Its action seems to be cumulative over a period of time and is thought to endure for from a few years to a life-time.

*Production of immunity:* For the production of immunity we use, at the present time, either a vaccine or a toxin depending, of course, upon the specificity of the immunity to be conferred.

*Diphtheria:* Of the contagious diphtheria is one of the most urgent to demand attention. In immunizing against this disease we may use one of three agents, i. e.,—toxin-antitoxin, toxoid or alum precipitated toxoid. In children of eight years or older perhaps toxin-antitoxin is preferable because of lessened danger of, and a milder reaction to, its use. When used it should be given subcutaneously in doses of one c.c. three weeks apart and for 3 doses. Toxoid may be used and has the advantage of producing a slightly higher rate of immunity. Its recommended dosage is 1 c.c. subcutaneously, every three weeks for two doses. Personally I believe that 3 doses are preferable in that a higher rate of immunity is obtained from this amount. Alum precipitated toxoid may be said to be the successor of the other two, has the advantage of lessened dosage and possibly a higher rate of immunity. One injection, subcutaneously, of one-half to 1 c.c. is recommended but in some individuals two doses give a higher and more lasting immunity. I have adopted the policy of two doses of from  $\frac{1}{2}$  to 1 c.c. of alum precipitated toxoid in all children under eight years old, the second dose in three weeks following the first.

Because of the rapid loss of natural immunity following birth, the higher incidence and the serious consequences of infection in the low age groups, inoculation is urgent and should be done at, or about, six months of age. With alum precipitated toxoid immunity reaches its height in from 3 to 4 months and includes about 95% of those inoculated.

The most acceptable method of inoculation, at the present time, is by the subcutaneous route. However, some physicians use and recommend the intradermal method and claim for its use less reaction. If used intradermally the customary dose of alum precipitated toxoid is one-tenth that of the subcutaneous, and in this dosage it is said to be just as potent, causes less reaction in the older groups, and is particularly adapted to allergic individuals. Toxoid should

not be used intramuscularly because of the increased danger of local reactions.

*Schick Test:* The Schick test is a fairly reliable guide as to the susceptibility of an individual to diphtheria. Proper technic should produce a small bleb which, in susceptible individuals, will give a true reaction in from 48 to 96 hours. This reaction is thought to give a fair indication of the amount of circulating antitoxin in the blood-stream of the individual, but is not as definite, in certain cases, as is assumed. In some infants the Schick test may be negative, even where there is a lack of circulating antitoxin because of low reactive power of the skin, or it may be possible to obtain a positive reaction with a high circulating antitoxin due to a hypersensitiveness of the skin to diphtheria toxin. The latter result, however, would tend to predominate in the adult. In spite of these unreliable factors, the Schick test is our only guide to immunity and should, for this reason, be used.

In infants and young children this test should be ignored unless, or until after, toxoid has been administered. This test should, however, be administered in about six months following toxoid inoculation and should be repeated each year thereafter through the pre-school period and/or until a certainty of immunity exists. Thereafter it should be repeated at intervals of two or three years throughout childhood, and at the time of diphtheria epidemics. The technic consists of introducing, hypodermically and intracutaneously, about one-tenth of a c.c. of diphtheria toxin into the flexor surface of the forearm. I mention pseudoreactions only to warn against misinterpretation.

*Smallpox:* I speak of smallpox immunity in the light of neglect. Because of the relative infrequency and the decreased severity of smallpox a laxity of vaccination has become apparent on both the part of the physician and the layman. Unless active immunity is constantly being conferred smallpox may, in succeeding generations, become rampant.

The best technic for vaccinating, I believe, is by the single or multiple pressure methods. This is best done with a small blunt instrument such as an optician's screwdriver. After sterilizing, the content of a vaccine tube is placed upon the site of vaccination. The instrument is then placed upon the skin under the vaccine, moder-



ate pressure exerted and the instrument rotated. This causes a small break in the skin with a consequent exudation of serum. Several breaks may be made and the vaccine rubbed in if thought desirable, but this is not necessary. The vaccine is allowed to dry before any protection is placed over the point of inoculation. This is a modification of the old Von Pirquet test. A negative result does not necessarily indicate immunity unless the individual has a typical vaccination scar or has had smallpox, and even in such cases may be due to faulty technic or impotent vaccine.

A typical vaccination scar is one that is elevated, pale, dull and pitted. The size of the scar is not important. An atypical scar is usually large, depressed, shiny, without pits; is the result of an infection and no guarantee of an immunity.

Vaccination should be repeated one or more times if negative and where no reason for immunity is known, during an epidemic or upon frequent exposure to smallpox.

*Whooping Cough:* Immunization against pertussis is a rather recent accomplishment. Attempts have been made with various substances for a good many years, but none were successful to the degree of reliability. We now have an agent in authorized commercial vaccine, the credit for which goes to Dr. Louis W. Sauer, which is reliable in better than 80% of cases according to reports.

This vaccine is given in three weekly, bilateral, subcutaneous injections. For children under 3 years, 8 c.c. is probably sufficient, 1 c.c. in each arm for the first dose; 1.5 c.c. in each arm for the second dose; and 1.5 c.c. in each arm for the third dose. In children over 3 years of age I feel that it is wiser to use 10 c.c., increasing the second and third doses to 2 c.c. bilaterally. At least four months must elapse before immunity is fully established. Reactions, both general and local, are at times encountered, but I have seen none severe enough to be of any consequence. This vaccine should be given during the first year of life at about nine months of age. Kreuger's vaccine seems to act very well as a therapeutic agent, but from reports is not so efficient in establishing active immunity.

*Scarlet Fever:* Immunity is accomplished quite successfully, according to reports from large institutions in different parts of the country, by giving five inoculations, at weekly intervals, of

scarlet fever toxin. The Dicks recommend 500, 2000, 8000, 25000 and 80000 skin test doses to be given successively. While most health departments and some private physicians urge its use, my personal attitude is that it lends itself admirably to institutional procedure, but its use in private practice should be with caution. An objectionable feature in office or home use is the necessity of five doses. Many parents hesitate to submit their child to a series of five injections and of those who start, many discontinue before the process is complete. The fear of reactions, by many physicians, I believe is well founded, for we do get many, and some well marked reactions, both local and systemic. In some individuals only slight reactions, as slight rise of temperature and rash are noted; in others moderate reaction, as denoted by moderate temperature, lassitude, rash, nausea and vomiting; while in still others severe reactions take place, as manifest by high temperature, vomiting, diarrhea and prostration. Local reactions, of which the percentage averages around 25, are in the nature of redness, swelling, marked tenderness and local pain. In my experience less than 50% get no reaction whatever. As a rule, the first two or three injections cause little or no trouble, the later inoculations causing the more marked reactions. When given, parents should be warned of the likelihood of reactions.

Ricinoleated antigen has been tried for active immunization but was found to produce an immunity of short duration, and the reactions following its use were rather severe. Friedman et al. state that percutaneous and nasal administrations of the toxin have some immunizing power, but the oral route is unsuccessful.

Scarlet fever antitoxin may be used for passive immunity or for treatment, but if so, marked reactions may be expected.

As to the period of immunity, when conferred by scarlet fever toxin, the time is not definitely known, but is supposed to be lasting in many individuals, while indefinite or soon lost in others. Of course, this fact alone should not be a deterrent in giving the inoculations, as we know that scarlet fever does not, in some individuals, produce a lasting immunity.

For passive immunity against scarlet fever probably the best procedure is the injection of from 10 to 20 c.c. of convalescent serum. If

given early after exposure its efficiency is almost 100% and protects for about two weeks.

*Measles:* As yet there exists no proven method of producing active immunity to measles. However, there has been developed an immune globulin from human placenta which does, from reliable reports, produce a partial passive immunity in a fair percentage of individuals, modifies the severity of the disease and tends to prevent complications. Four c.c. or more is injected into the gluteal muscle, the partial immunity lasting for from 3 to 4 weeks. In treatment for measles McKahann recommends a dosage of 2 to 4 c.c., repeated at the discretion of the physician. Immune globulin is equally or more efficacious than either adult or convalescent serum.

250 North Water Street.

### DISCUSSION

Dr. John R. Vonachen, Peoria: From a practical standpoint we must be well informed on immunization against contagious diseases because the laity of the present day are hungry for information. I always make it a point to explain to my patients that no immunizations are 100% perfect, and that failures can be expected. Each physician should have a preventive medicine outline to present to his patients particularly during the first year or two of life. Ordinarily, I immunize my infants between six and seven months against diphtheria, between nine and ten months against whooping cough, and vaccinate them against smallpox between eleven and twelve months. If one finds, however, that one or the other is more prevalent in the community, the whooping cough, diphtheria immunizations can be reversed. Now as to the type of material to use. Generally speaking, alum precipitated toxoid confers an immunization from 90 to 95%; plain diphtheria toxoid about 90%, and diphtheria toxin-antitoxin about 87%. The children over five years of age in my experience oftentimes have quite severe reactions from the alum precipitated toxoid, and I believe these cases should be given the plain diphtheria toxoid, two injections three weeks apart. There have been many reports in the literature of abscess formation and nodule formation following alum precipitated toxoid. In some cases this has been attributed to the particular batch of toxoid. Some contend that the child from the age of ten to fourteen years should be given diphtheria toxin-antitoxin.

Just a few words about the Schick test. It is far better to encourage our patients to read this test no earlier than forty-eight hours, and preferably seventy-two hours to avoid a wrong impression of false reactions. In regard to whooping cough immunizations, it is now generally conceded that the failures are only about 3.7%, so this is a prophylactic measure which can be well recommended to patients, without any ill effects from its use. The usual dosage familiar to all of you is ordinarily to use a vaccine containing ten

million organisms to the cc, giving 1 cc in each arm for the first injection, then for two succeeding weeks  $1\frac{1}{2}$  ccs in each arm, making a total of 8 ccs. This ordinarily confers immunity in from three to four months, after the final injection. It might be interesting to know that Dr. Frawley of Fresno, California, reports good results with Krueger's whooping cough endantigen in the treatment of the disease, in that the cases can be rendered mild by giving 5 ccs twice a day, up to a total dosage of 60 to 80 ccs. This produces results when given after exposures up to one week after infection but not later. He emphasizes that these whooping cough cases with upper respiratory infections do not respond so well to this treatment.

In conclusion let me say that a great part of your effort in obtaining results with both toxoid and whooping cough vaccine is to keep these materials properly refrigerated. Do not carry them around promiscuously in your daily kits.

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### WHEN THE SLIP GETS BY

The typographical error is a slippery thing and sly.  
You can hunt till you are dizzy, but it somehow will get by.  
Till the forms are off the presses it is strange how still it keeps;  
It shrinks down into a corner and it never stirs or peeps,  
That typographical error, too small for human eyes,  
Till the ink is on the paper, when it grows to mountain size.  
The boss he stare with horror, then he grabs his hair and groans;  
The copy reader drops his head upon his hands and moans—  
The remainder of the issue may be clean as clean can be  
But that typographical error is the only thing you see.  
—Knoxville (Ia.) *Express*.

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### THE SMALL INTESTINE

Eugene P. Pendergrass, Philadelphia (Journal A. M. A., Dec. 5, 1936), points out that relatively little investigative work has been done on the small intestine by roentgenologists, and because of this the interpretation of its lesions is much more difficult than of other portions of the gastro-intestinal tract. Consequently, only obvious lesions have been diagnosed. It is essential that collective studies be made of the small intestine in healthy individuals and in patients having lesions of the small intestine. Lesions involving other portions of the gastro-intestinal tract as well as conditions outside of it may exert a profound influence on the mechanics and pattern of the small intestine. Any investigation, therefore, should include a careful consideration of all such factors. A standard meal is suggested, so that one roentgenologist may compare his results with those of another. The pattern of the small intestine will vary considerably, depending on the composition of the foodstuff it receives. It varies also with



the consistency of the meal, its size, the gastric emptying time and the tonicity of the intestinal tract. Certain pathologic conditions which only indirectly affect the intestinal tract may cause a very profound change in the small intestine pattern. The meal that the author uses consists of 5 ounces (140 Gm.) of barium sulfate and 5 ounces (150 cc.) of water. Such a meal has the consistency of a thick pabulum but allows excellent visualization of the mucosal pattern. The small intestine not only plays a major rôle in preparing foodstuffs for digestion but it is also the portion of the gastrointestinal tract which is most active in the absorption of the products of digestion. The examination of the small intestine requires several hours as a rule, and occasionally its physiologic function has been disturbed as a result of the patient having developed a headache because of food being withheld. What part psychic or emotional disturbances may take in influencing the motility and pattern of the small intestine is not known but there is reason to believe that fear is occasionally a potent factor.

#### METHODS IN SPERM ANALYSES AND EVALUATION OF THERAPEUTIC PROCEDURES

Robert S. Hotchkiss, New York (*Journal A. M. A.*, Dec. 5, 1936), states that the purpose of any study of infertility is not only to detect absolute sterility but rather to arrive at an estimation of the relative fertility of each partner, each to be considered separately and together as a marital unit. The appraisal of the semen constitutes the chief and final index of male fertility. A routine semen analysis should include the following details: 1. The average volume of the ejaculate is from 3 to 4 cc. Variations from one or two drops to 10 cc. are encountered. Specimens of less than 0.5 cc. in amount fail to produce an adequate seminal pool, which ordinarily provides a medium for the survival and protection of the sensitive sperm. 2. The appearance and viscosity of the fresh ejaculate is entirely different from that one-half hour old. Self liquefaction is then completed, much to the benefit of motility of the sperm. If the eventual motility is of a good grade it is likely that variations in viscosity have little or no clinical significance. 3. The  $pH$  of a seminal specimen usually falls within the range of from 7.7 to 8.5. If no motility is found it is of particular importance to obtain a  $pH$  determination, for in rare instances a shift to a low reading of 6 and 6.2 has been found to be associated with necropermia. 4. Interval examinations should be made to determine the viability of the sperm, which is usually about twenty-four hours at room temperature. 5. The number of spermatozoa is determined by the use of the usual equipment for counting blood cells. A sodium bicarbonate-phenol solution is used as the diluent; it destroys motility to permit an accurate estimation of the cells present in each cubic centimeter and in the total ejaculate. The average fertile male will produce from 100,000,000 to 150,000,000 spermatozoa per cubic centimeter or from 400,000,000 to 500,000,000 in the total ejaculate. 6. The examiner must be familiar with the variations in the morphology of the sperma-

tozoa just as the hematologist is conversant with blood cytology.

#### SUNRAY HEMANGIOMA OF BONE, WITH SPECIAL REFERENCE TO ROENTGEN SIGNS

William E. Anspach Chicago (*Journal A. M. A.*, Feb. 20, 1937), studied the roentgenographic changes of hemangioma of the skull in a child aged 11 years in 1921 and again fifteen years later. Excepting for a large mass on the head, the patient's health has not been impaired in any way. Hemangioma of flat bones produces a sunray formation on roentgenograms. Hemangioma of long bones often produces a "loose soap bubble" appearance but almost as frequently the sunray pattern of density. The latter is often confused with osteogenic sarcoma of bone, which also produces divergent spicules of bone. While hemangioma is less destructive, slower growing and less painful and produces the more clearly outlined trabeculation, a biopsy should be obtained before removal is attempted. Rarely should hemangioma of bone be removed. When hemangioma involves vertebrae, a vertical striated appearance is produced which is almost characteristic of this one type of tumor. Therefore the kind of bone involved by the tumor in a given case is of prime importance in weighing x-ray evidence. Roentgen or radium therapy has the same favorable effect on hemangioma of bone as on hemangioma of soft tissue if treatment is instituted before dense bone is deposited within the tumor. Even later it is of definite benefit in arresting growth. The sensitivity of benign hemangioma to roentgen therapy must not be interpreted as evidence favoring malignancy.

Disturbances of iron absorption may occur during the course of alkaline therapy for peptic ulcer. When the upper gastro-intestinal tract is rendered alkaline as in the Sippy treatment of peptic ulcer, impairment of iron absorption and utilization results in anemia. This iron deficiency anemia closely resembles idiopathic hypochromic anemia. (Ed.: This would seem to indicate that iron by parenteral injection would be indicated in these cases.) Kellogg & Mettier, *Arch. Int. Med.*, 58:278 (August) 1936.

### Society Proceedings

#### COOK COUNTY CHICAGO MEDICAL SOCIETY

*Regular Meeting, Wednesday, February 3, 1937*

#### PROGRAM

The History of Syphilis, B. Barker Beeson.  
The General Picture of Syphilis, Frank J. Jirka, Director, State Department of Public Health.  
Epidemiology, G. Howard Gowen, Assistant Epidemiologist, State Department of Public Health.  
Wassermann Test and Its Interpretation, H. J.

Shaughnessy, Chief of Laboratories, State Department of Public Health.

Syphilis and Insanity, Francis J. Gerty.

Discussion by William Allen Pusey.

#### AMERICAN MEDICAL ASSOCIATION NIGHT

Introduction of Guests of Honor—Thomas P. Foley; J. H. J. Upham, President-Elect; William Allen Pusey, Past-President; Wilber Post, Past-President; Arthur Dean Bevan, Past-President; W. L. Biering, Past President.

Forward, Olin West, Secretary and General Manager American Medical Association.

535 North Dearborn Street—Modernized and Enlarged, Austin A. Hayden, Secretary, Board of Trustees, American Medical Association.

The Legislative Committee's Work, Edward H. Cary, Chairman, Committee on Legislative Activities, American Medical Association, Dallas, Texas.

Your American Medical Association, Charles Gordon Heyd, President, American Medical Association, New York City, New York.

General Discussion, Morris Fishbein, Editor, Journal American Medical Association.

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#### PIKE COUNTY

The Pike County Medical Society met in Pittsfield, January 28, when the following program was given by Jacksonville physicians.

Pneumothorax in the Treatment of Tuberculosis by Friedrich Engelbach.

Otitis Media in Children, by George L. Drennan.

Preventive Surgery by Carl E. Black, with discussion on the latter paper led by Vincent T. Lenth.

These papers were all very well given and received with interest by all present.

In the business meeting which followed the program action was taken supporting the Council in the resolution in regard to the proposed change of the United States Public Health Service from the Treasury Department to the proposed Department of Public Welfare and in regard to the establishing of a Department of Public Health.

All members of the profession resident in Calhoun County who are affiliated with organized medicine being members of the Pike County Society, it was voted to change the name of this Society to "The Pike-Calhoun Counties Medical Society."

In the annual election of officers the following were elected: President, Wm. Skeele, Hardin; vice-president, L. Y. Davis, Baylis; secretary-treasurer, F. N. Wells, Pittsfield; delegate to state meeting, P. V. Dilts, Pittsfield; alternate, J. S. Altman, Pittsfield.

F. N. WELLS, *Secretary*.

Adjournment was taken, to meet again in Pittsfield April 22.

#### Marriages

ROLAND LINCOLN KESLER, Chicago, to Miss Margaret Lee of Gordon, Neb., Nov. 11, 1936.

EMMET F. PEARSON, to Miss Mary Louise Maxon, both of Springfield, Ill., Feb. 20, 1937.

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#### Personals

Dr. Ralph B. Bettman, Chicago, addressed the Whiteside County Medical Society at Sterling, January 18, on "Surgical Treatment of Emphysema of the Chest."

Dr. Mark T. Goldstine, Chicago, addressed the Peoria City Medical Society, February 2, on "Pelvic Infections."

Dr. Ralph C. Hamill, Chicago, was re-elected president of the Illinois Society for Mental Hygiene at its annual meeting, January 21.

Dr. Frances A. Ford, Detroit, addressed the Chicago Council of Medical Woman, February 5, on "The Contact of the Average Physician with the Problem of Cancer."

Dr. Harold J. Noyes, clinical associate of pediatrics, Rush Medical College, addressed the Cleveland Dental Society, February 1, on "Modern Dental Contributions to Medical Diagnosis." Dr. Noyes also has a degree in dentistry.

The La Salle County Medical Society was addressed, January 21, by Drs. Robert S. Berghoff and Eustace L. Benjamin, Chicago, on heart disease and pathology of the common lesions of the heart, respectively. In the afternoon Dr. Berghoff conducted a heart clinic.

Dr. Daniel L. Sexton, St. Louis, addressed the Madison County Medical Society, Madison, January 8, on "Endocrinology in General Practice."

At a meeting of the Will-Grundy County Medical Society at Joliet, January 20, Dr. Milton Mandel, Chicago, spoke on "Pneumonia."

John McKinlay was elected president of the Presbyterian Hospital Association at its annual meeting, January 20, succeeding Alfred T. Carton, who resigned.

At a meeting of the Christian County Medical Society in Taylorville, January 27, Dr. Earl O. Latimer, Chicago, spoke on "Abdominal Pain from a Surgical Standpoint."



Dr. Alfred Adler of Vienna gave a lecture January 24, on "The Meaning of Neurosis." The lecture was under the auspices of the Chicago Association for the Study and Advancement of Individual Psychology.

Dr. R. P. Mackay gave a paper on "The Treatment of Neurosyphilis" before the Will-Grundy County Medical Society on January 27.

Dr. Earl O. Latimer addressed Christian County Medical Society on January 27, subject, "Abdominal Pain from a Surgical Standpoint."

W. William C. Beck and Orville E. Barbour presented the scientific program before the Henry County Medical Society on January 28, subjects, "Surgical Treatment of Peripheral Vascular Disease," and "Vomiting and Colicky Babies."

Dr. Earl A. Zaus addressed the Bureau County Medical Society on February 2, subject, "Coronary Sclerosis."

Dr. James J. Callahan addressed the Scott County Medical Society at Davenport on February 2.

Dr. Robert C. Levy gave a paper on "Pneumonia" before the Iroquois County Medical Society on February 2.

Dr. George J. Musgrave gave a paper on "The Nasal Accessory Sinuses," before the Will-Grundy County Medical Society on February 3.

Dr. Harry M. Hedge addressed the Aurora Medical Society on February 4, subject, "Diagnosis and Treatment of Syphilis."

Dr. I. M. Levin addressed the Norwood Park Parent-Teacher Association on February 11, subject, "Health Problems of Interest to the Parent."

Dr. Allan J. Hruby spoke on "Tuberculosis, How It Is Handled in Chicago," before the Public Health Chairmen of the Illinois Federation of Women's Clubs, February 8.

Dr. Daniel H. Levinthal has been invited to hold operative bone and joint clinics and lectures on orthopaedic surgery before the Tampico Medical Society.

Dr. Milton Mandel gave a paper on "Pneumonia" before the Will-Grundy County Medical Society at Joliet on February 10.

Drs. Maurice L. Blatt and William J. Dieckmann presented the scientific program at the February 10 meeting of the Jefferson-Hamilton County Medical Society, in Mount Vernon. Their subjects was "Neonatal Deaths" and "Obstetric Hemorrhage."

Dr. I. Harrison Tunpeer was guest of honor at the Inaugural meeting of the Oklahoma City Pediatric Society and presented "Interesting Pediatric Phenomena" with lantern slides at the Oklahoma University Club, Oklahoma City, January 29.

Drs. Fremont C. Chandler, Julius H. Hess and S. W. Becker were invited as guest instructors to the International Post Graduate Medical Assembly, held at San Antonio, Texas, January 26-27-28, 1937.

Dr. Ralph A. Reis gave a gynecological clinic for the Sioux Valley Medical Society, Sioux City, Iowa, and delivered an address on "The Third Stage of Labor," January 19, 1937.

Dr. Irving S. Cutter, Chicago, addressed the Peoria Medical Society, February 16, on "The Future of Medicine."

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## News Notes

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—The dedication of the new \$200,000 annex to the St. Francis Hospital will take place in May. Work was started last July. The present building of the hospital was constructed in 1923.

—Dr. Wingate Todd, Henry Wilson Payne professor of anatomy, Western Reserve University School of Medicine, Cleveland, delivered the thirteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation, February 26. His subject was "Objective Ratings on the Constitution; Based Upon Examinations of Physical Development and Mental Expansion in the Growing Child."

—A meeting of the Society of Illinois Bacteriologists was held at the Chicago Woman's Club, January 23, with the following speakers:

—Dr. Oswald H. Robertson, professor of medicine, department of medicine, Division of Biological Sciences, University of Chicago, The Role of the Macrophage in Recovery from Experimental Lobar Pneumonia.

—Dr. Sol. R. Rosenthal, associate in the department of pathology, bacteriology and public

health, University of Illinois College of Medicine. Cellular Response in the Host to Antigenic Substances.

—James Russell Esty, Ph.D., research director, Western Branch, National Canners' Association, San Francisco, Bacteriological Problems of the Canning Industry.

—Fifty-four new typhoid carriers were detected in Illinois during 1936. This brings the number of carriers under state supervision to 162, according to the Illinois Department of Health.

—The Chicago Orthopedic Society and the Chicago Roentgen Society held a joint meeting at the Palmer House, February 15, with the following speakers: Drs. John A. Siegling, "Studies on the Development and Growth of the Epiphyses of the Long Bones"; John D. Camp, Rochester, Minn., "Roentgenologic Observations Concerning Intraspinal Protrusion of the Intervertebral Disk in Patients with Sciatic and Low Back Pain," and Myron O. Henry, Minneapolis, "Chip Grafts in Orthopedic Surgery."

—S. 8 proposes to grant to physicians and hospitals, treating persons injured through the negligence of others, liens on all claims, verdicts, judgments or decrees accruing to such persons by reason of their injuries. H. 21 proposes to authorize the sexual sterilization of persons convicted of forcible rape, incest, sodomy or taking indecent liberties with children. The bill also provides that nothing therein contained is to be construed to authorize the operation of castration or the removal of sound organs. H. 95 proposes to authorize the emasculation of persons convicted of the crime of rape, incest, taking indecent liberties with children, sodomy or the crime against nature. H. 97 proposes to appropriate \$200,000 for the purchase of radium and radium equipment for the research and educational hospitals in Chicago.

The display window in the Marshall Field & Co. Annex Building now carries an interesting exhibit on THE HEART. Dr. Robert S. Berghoff loaned some unusual and attractive blue prints showing various conditions of the heart and Mr. Tom Jones of the University of Illinois loaned a very beautiful model of the heart. The window is worth seeing.

—A special program of lectures and demonstrations in surgery and medicine will be held under the direction of The Mayo Foundation

from April 5 to 9, inclusive. Mornings will be devoted to surgical and medical clinics. In the afternoons and evenings, in addition to the clinico-pathologic conferences, symposiums will be conducted on urology, cardiology, gastro-enterology, dermatology, endocrinology, diseases of the colon and rectum, orthopedics and arthritis. Visiting physicians will be welcome guests.

The Gehrman Lectures for 1936-1937 will be delivered in the Medical and Dental College Laboratories Building, 1853 West Polk street, University of Illinois, College of Medicine, Chicago, Illinois, in Room 423, on March 22, 23, and 24, 1937, by Dr. Thomas Parran, surgeon general, United States Public Health Service, Washington, D. C.

#### PROGRAM

March 22, Monday, 5 P. M.—"Health as a Factor in Social Security."

March 23, Tuesday, 5 P. M.—"Industrial Hygiene."

March 24, Wednesday, 1 P. M.—"Syphilis."

You are cordially invited to attend.

### Deaths

SAMUEL D. DONOVAN, Dewey, Ill.; St. Louis College of Physicians and Surgeons, 1905; member of the Illinois State Medical Society; aged 53; on the staff of the Mercy Hospital, Urbana, where he died, Dec. 9, 1936, of carcinoma.

WILLIAM B. EICHER, Peoria, Ill.; Keokuk (Iowa) Medical College, 1898; member of the Illinois State Medical Society; aged 67; died suddenly, Dec. 7, 1936, in the Illinois Central Hospital, Chicago, of suppurative diverticulitis and multiple liver abscesses.

WILLIAM LYMAN GUILD, Wayne, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1884; Chicago Homeopathic Medical College, 1892; member of the Illinois State Medical Society; surgeon to the Chicago, Aurora and Elgin Railroad; aged 77; died, Dec. 18, 1936.

COLEMAN LOVEJOY HOFFMAN, Oak Park, Ill.; State University of Iowa College of Medicine, Iowa City, 1903; member of the Illinois State Medical Society; veteran of the Spanish-American War; aged 58; died, Dec. 17, 1936, in the West Suburban Hospital of acute nephritis, uremia and Kimmel's disease.

SULLIVAN HOWARD, Elk Creek, Neb.; University of Denver, Colo., 1892. Practiced over 40 years at Elk Creek, Neb.; died, Feb. 2, 1937, of cerebral hemorrhage in St. Petersburg, Fla., and was interred in Macomb, Ill.; aged 71 years.

HENRY GROVER KURZ, Chicago; Chicago College of Medicine and Surgery, 1909; a Fellow, A. M. A.; aged



52; died, January 7, in the Dante Hospital, San Francisco, of rupture of a dissecting aortic aneurysm.

JOHN MICHAEL MURPHY, Chicago; Jenner Medical College, Chicago, 1914; for many years city health inspector and at one time head of the inspection department; aged 51; died, Dec. 30, 1936, of chronic myocarditis.

SAMUEL ALLEN OREN, Lewistown, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1877; State University of Iowa College of Homeopathic Medicine, Iowa City, 1878; aged 82; died, Dec. 9, 1936, of diabetes mellitus.

JOSEPH P. PERCIVAL, Berwyn, Ill.; John A. Creighton Medical College, Omaha, 1896; a Fellow, A. M. A.; for many years connected with the Cook County Psychopathic Hospital, Chicago; formerly superintendent of the State Hospital, Norfolk, Neb., and the Chicago State Hospital; aged 71; died, Dec. 27, 1936, of bronchopneumonia.

GEORGE FREDERICK PIERCE, Chicago; Trinity Medical College, Toronto, Ont., Canada, 1895; on the staff of the Garfield Park Hospital; aged 70; died, January 2, of arteriosclerosis, diabetes and gangrene of the left foot.

ELZA CARL PORTER, Chicago; University of Illinois College of Medicine, Chicago, 1927; a Fellow, A. M. A.; served during the World War; on the staff of the Lake View Hospital; aged 38; died, Dec. 25, 1936, of lobar pneumonia.

EUGENE B. PRIBBLE, Salem, Ill.; Medical College of Ohio, Cincinnati, 1906; member of the Illinois State Medical Society; formerly member of the city council; aged 59; died, Dec. 30, 1936, of pneumonia, fracture of the hip as the result of a fall, and hypertension.

THEODORE SCHAPS, Chicago; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1920; a Fellow A. M. A. served during the World War; on the staffs of the Alexian Brothers' Hospital and the Evangelical Deaconess Hospital; aged 46; died, Dec. 11, 1936, of cirrhosis of the liver, gastric hemorrhage and pneumonia.

FRANK SMITHIES, Chicago; Chairman of the Section on Gastro-Enterology and Proctology of the American Medical Association, 1919-1920, member of the House of Delegates, 1927-1930, and in 1930 appointed a member of the Council on Scientific Assembly for five years, died, February 9, in the Augustana Hospital, of a cerebral hemorrhage, aged 56. Dr. Smithies was born in Elland, Yorkshire, England, Dec. 21, 1880. He received the medical degree from the University of Michigan Department of Medicine and Surgery, Ann Arbor, in 1904, and later studied abroad. He had been assistant in the clinical laboratory, instructor in medicine and demonstrator in clinical medicine at his alma mater, assistant in medicine at Rush Medical College, Chicago, assistant in pathology at the University of Berlin, and attending physician to the University of Michigan Hospital. From 1910 to 1913 he was in charge of the gastro-enterologic laboratory and an assistant in one of the sections on medicine at the Mayo Clinic, Rochester, Minn. He was appointed gastro-enterologist in the Augustana Hospital, Chicago, in 1913, and attend-

ing physician in 1922. He became associate professor of medicine at University of Illinois College of Medicine in 1917 and professor of medicine in 1922. Dr. Smithies was a fellow and past president of the American College of Physicians and the American Therapeutic Society; member and past president of the American Gastro-Enterological Association; formerly secretary general of the American Congress on Internal Medicine, and past president of the American Society of Tropical Medicine. He was formerly physician in chief and head of the department of medicine at St. Elizabeth's Hospital, attending physician at the Henryrotin Hospital, chief of clinic in digestive diseases at the Municipal Tuberculosis Sanitarium and consulting physician to the Chicago, Milwaukee, St. Paul and Pacific Railroad. During the World War he was consultant in medicine in the U. S. Public Health and Marine Hospital Service, Port of Chicago; secretary and consulting internist, Medical Advisory Board 3B, Chicago, and member of the Illinois State Board of Advisers in Administration of Draft. In 1930 he was appointed a foreign member of the Société médicale des hôpitaux de Paris and in 1933 was awarded the cross of the French Legion of Honor. Dr. Smithies was the author of "Cancer of the Stomach" and of numerous articles and was editor in chief of the *American Journal of Digestive Diseases and Nutrition* and on the advisory board of the *American Journal of Tropical Medicine*.

WILLIAM GUILFORD STEARNS, Chicago; Northwestern University Medical School, Chicago, 1893; a Fellow, A. M. A.; professor of pathological anatomy and general pathology at the Northwestern University Dental School, 1894-1898, and assistant professor of mental diseases and medical jurisprudence at his alma mater, 1898-1900; lecturer of neurology at the College of Physicians and Surgeons, 1900-1902; fellow of the American College of Physicians; member of the American Psychiatric Association and the Central Neuropsychiatric Association; chairman of the section on insanity of the National Conference of Charities and Correction in 1898; served with the Medical Advisory Board No. 3E, Selective Service, as a consultant in neuropsychiatry, 1917-1919; assistant physician to the Illinois Eastern Hospital for the Insane, Kankakee, Ill., 1894-1895, pathologist, 1895-1897, and medical superintendent, 1897-1899; medical superintendent of the Oakwood and Lakeside Sanatoria, Lake Geneva, 1900-1904; medical director of the North Shore Health Resort, Winnetka, Ill., 1931-1936; aged 71; died, January 11, at his home in Evanston, Ill.

SAMUEL LOUIS WEBER, Chicago; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1888; a Fellow, A. M. A.; on the staff of the Hospital of St. Anthony de Padua; aged 75; died, Dec. 18, 1936, of coronary embolism and arteriosclerosis.

EDWIN F. WINEGAR, Chicago; Chicago Physio-Medical College, 1898; member of the Illinois State Medical Society; formerly on the staff of the Illinois Central Hospital; aged 70; died, Dec. 8, 1936, in a hospital at Phoenix, Ariz., of meningitis.

## Old Way...

### CURING RICKETS in the CLEFT of an ASH TREE

FOR many centuries,—and apparently down to the present time, even in this country—ricketic children have been passed through a cleft ash tree to cure them of their rickets, and thenceforth a sympathetic relationship was supposed to exist between them and the tree.

Frazer\* states that the ordinary mode of effecting the cure is to split a young ash sapling longitudinally for a few feet and pass the child, naked, either three times or three times three through the fissure at sunrise. In the West of England, it is said the passage must be "against the sun." As soon as the ceremony is performed, the tree is bound tightly up and the fissure plastered over with mud or clay. The belief is that just as the cleft in the tree will be healed, so the child's body will be healed, but that if the rift in the tree remains open, the deformity in the child will remain, too, and if the tree were to die, the death of the child would surely follow.

\*Frazer, J. G.: *The Golden Bough*, vol. 1, New York, Macmillan & Co., 1928



It is ironical that the practice of attempting to cure rickets by holding the child in the cleft of an ash tree was associated with the rising of the sun, the light of which we now know is in itself one of Nature's specifics.

## New Way...

### Preventing and Curing Rickets with OLEUM PERCOMORPHUM

NOWADAYS, the physician has at his command, Mead's Oleum Percomorphum, a natural vitamin D product which actually prevents and cures rickets, when given in proper dosage.

Like other specifics for other diseases, larger dosage may be required for extreme cases. It is safe to say that when used in the indicated dosage, Mead's Oleum Percomorphum is a specific in almost all cases of rickets,

regardless of degree and duration. Mead's Oleum Percomorphum because of its high vitamins A and D content is also useful in deficiency conditions such as tetany, osteomalacia and xerophthalmia.

Mead's Oleum Percomorphum is not advertised to the public and is now obtainable at drug stores at a new economical price in 10 c.c. and 50 c.c. bottles and 10-drop capsules.

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than that of reduced iron, and is more readily adaptable to metabolism in the human body. Three Hematinic Plastules Plain provide the average patient with an adequate daily dose of iron to show a marked increase in hemoglobin. . . . Hematinic Plastules provide ferrous sulphate and vitamins B and G in an edible oil in the form of a semi-fluid mass, enclosed in soluble gelatin capsules which quickly dissolve in the stomach. . . . Hematinic Plastules are available in two types—Plain and with Liver Extract.

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## BUYERS INDEX

### ABDOMINAL SUPPORTERS

Storm, Katherine L., M. D., 1701 Diamond St., Philadelphia, Pa. .... 31

### AUTOMOBILES

Packard Motor Car Co., Chicago..... 30

### FOODS

Coca-Cola Co., Atlanta, Ga. ....

Corn Products Refining Co., New York City..... 4

R. B. Davis Co., Hoboken, N. J.....

H. J. Heinz, Pittsburgh ..... 16

Knox Gelatine Laboratories, Johnstown, N. Y.....

Mead Johnson & Co., Evansville, Ind..... 19

Nutrition, Inc., Beverly Hills, Cal..... 26

Ralston Purina Co., St. Louis, Mo..... 13

S. M. A. Corporation, Cleveland..... 2

The Wander Company, 180 N. Michigan Ave., Chicago.... 12

### FINANCIAL AND INSURANCE

Medical Protective Co., Fort Wayne, Ind..... 8

Physicians Casualty Co., Omaha, Neb..... 31

### HOSPITALS

Stokes Hospital, Louisville, Ky. .... 31

### PHARMACEUTICALS

American Agency, French Vichy, Brooklyn, N. Y..... 27

American Can Co., 230 Park Ave., New York City..... 3

Armour & Co., Chicago ..... 31

Bovine Company, Chicago..... 20

Bristol-Myers Co., New York..... 29

Carrick, G. W., Co., 411 Canal St., New York City..... 17

Carr Drug Co., Muncie, Ind..... 28

Ciba Company, Cedar and Washington St., New York City ..

Denver Chemical Co..... 24

Gold Pharmacal Co., New York City..... 31

Harrower Laboratory ..... 33

Hoffman-LaRoche, Inc., Nutley, N. J..... 7

Hynson, Westcott & Dunning, Charles and Chase Sts., Baltimore ..... 34

Lilly, Eli & Co., Indianapolis, Ind..... 18

Merck & Co., Rahway, N. J..... 14

Wm. S. Merrell Co., Cincinnati.....

Morris, Phillip, & Co., 19 Fifth Ave., New York..... 8

Numotizine, 900 N. Franklin St., Chicago..... 22

Parke, Davis & Co., Detroit, Mich..... 5

Petrolagar Laboratories, 8134 McCormick Blvd., Chicago... ..

Rare Chemicals, Nepera Park, N. Y..... 9

Reed & Carnrick, Jersey City, N. J.....

Schering & Glatz, Inc., New York City..... 15

G. D. Searle & Co., 4737 Ravenswood Ave., Chicago..... 11

Sharp & Dohme, 41 John St., New York City..... 17

E. R. Squibb & Sons, New York..... 35

Frederick Stearns & Co.....

Tilden Company, New Lebanon, N. Y..... 28

U. S. Standard Products Co., Woodworth, Wis..... 26

Wm. R. Warner & Co., 113 W. 18th St., New York City.. 10

Winthrop Chemical Co., 170 Varick St., New York City... 6

### SANATORIA AND SANITARIA

Edward Sanatorium, Naperville, Ill. .... 32

Elmlawn (Wilgus) Sanitarium, Rockford, Ill..... 25

Kenilworth Sanitarium, Kenilworth, Ill..... 25

Michell Farm Sanitarium, Peoria, Ill..... 36

Milwaukee Sanitarium, Wauwatosa, Wis..... Front Cover

Norbury Sanitarium, Jacksonville, Ill..... 25

North Shore Health Resort, Winnetka, Ill..... 32

Rogers Memorial Sanitarium, Oconomowoc, Wis..... 36

Waukesha Springs Sanitarium, Waukesha, Wis..... 25

Weirick's Sanitarium, Elgin, Ill. .... 31

### RADIUM

Physicians Radium Assn., 55 E. Washington St., Chicago.. 31

Radium and Radon Corp., 25 E. Washington St., Chicago.. 33

### SCHOOLS

Pogue School, Wheaton, Ill.....

### SURGERY INSTRUCTION

A. V. Partipilo, M. D., 1950 S. Ogden Ave..... 26

### SURGICAL SUPPLIES

W. A. Baum Co., New York..... 26

General Electric X-ray Corp., 2012 Jackson Blvd., Chicago 23

Oxinjector, Inc., 333 N. Michigan Ave., Chicago..... 26





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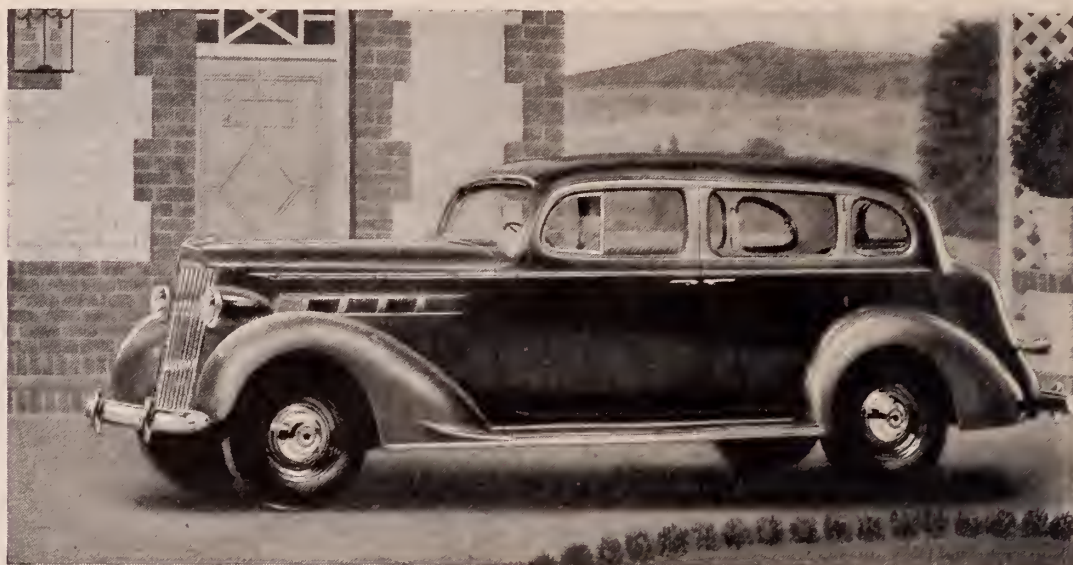
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**FEEDING OUR CHILDREN.** By Frank Howard Richardson, M. D. New York. Thomas Y. Crowell Company. 1937. Price, \$1.00.

This is a very practical work. It is a brief and authoritative summing up of the beliefs of the majority of the medical profession as to what are the important facts that should be known by those who plan and prepare the food eaten by one hundred and twenty million Americans, both children and adults.

**INHALATION ANESTHESIA.** By Arthur E. Guedel, M. D. New York. The Macmillan Company. 1937. Price, \$2.50.

This work is the result of the authors careful observation both during the war and subsequently thereto. The graduate physician, whether specialist or general practitioner, will find in this work a rational answer to many of his anesthetic problems.

**THE COLON AS A HEALTH REGULATOR—FROM A SURGEON'S POINT OF VIEW.** By Sir Henry M. W. Gray, Toronto. The Macmillan Company of Canada, Limited. 1936. Price, \$2.50.

This work is the result of the authors research, experiments and experiences over a period of twenty-five years. Forward looking surgeons and investigators will welcome Sir Henry Gray as a contributor of note to problems of surgical difficulty.

**ESSENTIALS OF ELECTROCARDIOGRAPHY.** By Richard Ashman, Ph.D., and Edgar Hull, M. D. New York. The Macmillan Company. 1937. Price, \$3.50.

This is a practical book for practitioners and medical students, which gives the essentials adequately in a form that is easily understood, giving an exhaustive list of criteria and making clear how an electrocardiogram should be measured and examined.

It presents much statistical and other data accumulated in years of study and observation, in which the author has had unusual opportunities.

**AUTOPSY, DIAGNOSIS AND TECHNIQUE.** By Otto Saphir, M. D. Sixty-five illustrations. New York. Paul B. Hoeber, Inc. 1937. Price, \$5.00.

This work is intended as a manual for medical students, practitioners, pathologists and coroner's physicians. This manual will meet the obvious need of the student for an outline of autopsy technique and diagnosis of diseased organs and structures as seen at the autopsy. The physician in general practice who may be compelled to perform an autopsy after having been away from the field for a number of years may likewise find this Manual of value.

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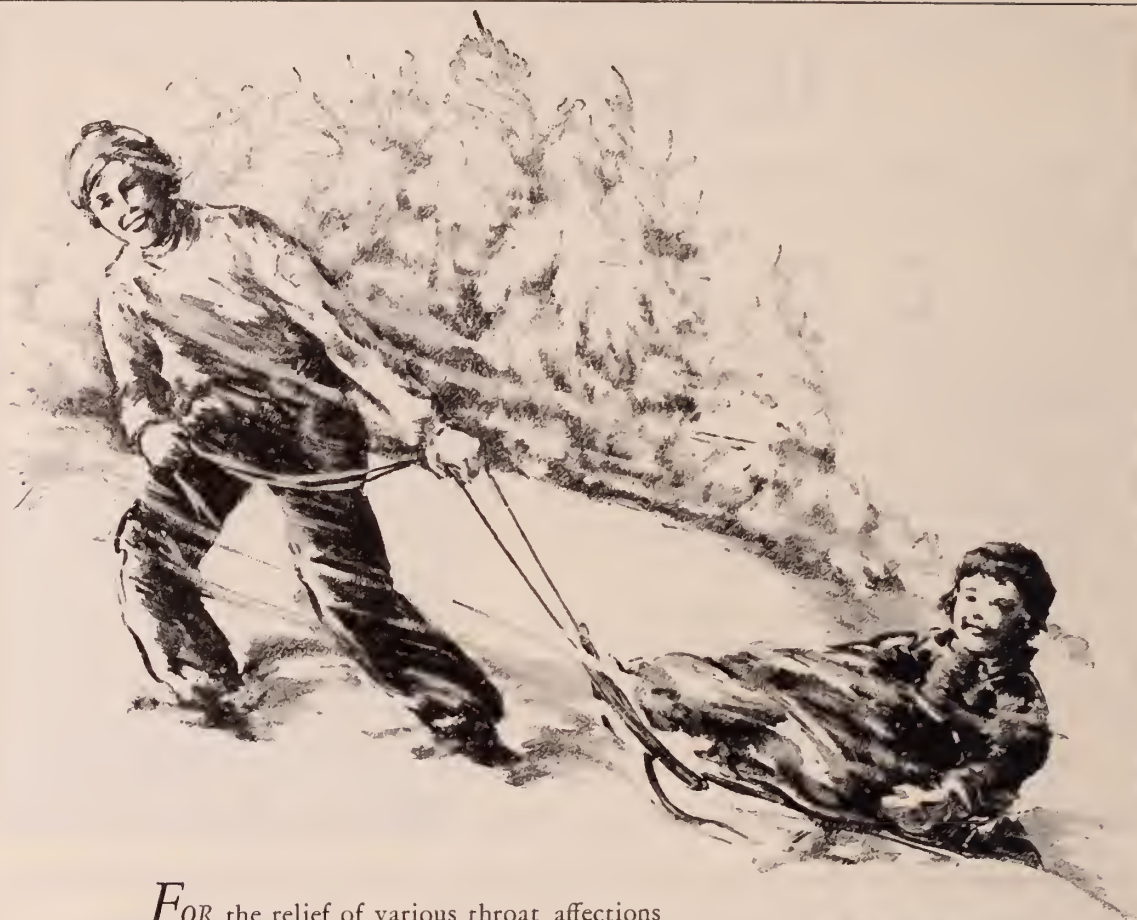
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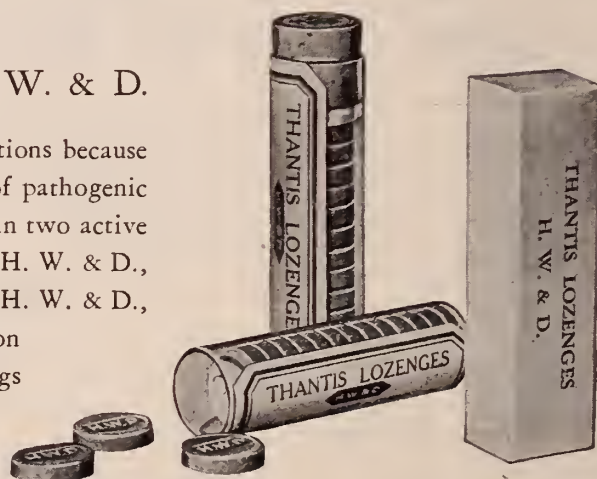




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# Illinois Medical Journal

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## CONTENTS:

Editorials (For Titles See Extended Table of Contents) ..... 277

### ORIGINAL ARTICLES

Unusual Features of Lung Cancer. *Cecil M. Jack, M. D., Decatur, Ill.*..... 315  
Radium Treatment of Secondary Parotitis. *Fred H. Decker, M. D., Peoria, Ill.*..... 319  
Chronic Sinusitis in Children. *J. R. Lindsay, M. D., Chicago.*..... 323  
Meningococcal Meningitis re Meningococcus Antitoxin. *Winston H. Tucker, M. D., Springfield, Ill.* 328.  
Acute Appendicitis. *Marshall S. Underhill, M. D., Evanston, Ill.* ..... 331  
Treatment of Petrositis. *Joseph C. Beck, M. D., and M. Reese Guttman, M. D., Chicago.*..... 333

Role of Emotions in Gastroduodenal Ulcers. *Samuel C. Robinson, M. D., Chicago.*..... 338  
Negative Tuberculin Reactors. *John Ritter, M. D., Miami, Fla.* ..... 347  
Experimental Influenza. *Hugh Macdonald, M. D., and E. J. Macdonald, M. D., Evanston, Ill.*..... 350  
Subacute Polymyositis. *Edward H. Warszewski, M. D., and John M. Radzinski, M. D., Chicago.* 351  
Tuberculosis Control re Tuberculin X-ray Plan. *E. A. Thacker, M. D., Urbana, Ill.*..... 354

### EDITORIALS

Motor Accidents Increase ..... 277  
America Needs No Non-Medical Boss..... 279  
Under the Panel System ..... 280

(Continued on page 8)

Eighty-Seventh Annual Meeting, at Peoria, May 18, 19, 20, 1937

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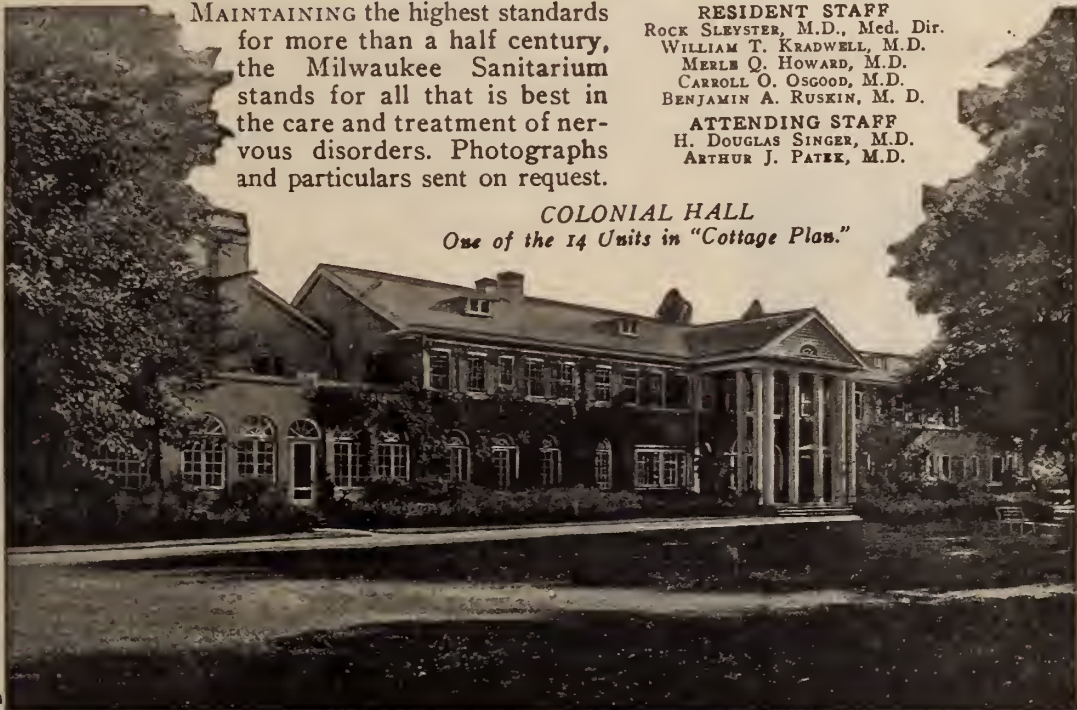
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# VITAMIN REQUIREMENTS OF MAN

## II. VITAMIN D

• The quantity of vitamin D required by an individual is influenced by such factors as environment, race, age, mineral content of the diet, and possibly by the source of the vitamin. Deficiency is manifest in children as rickets and decreased calcium retention, and in adults by the less well defined condition known as osteomalacia.

The minimum daily intake which will prevent rickets in infants is probably between 135 and 400 International units of vitamin D as supplied by cod liver oil (1). The optimum prophylactic dose is probably in the neighborhood of 1000 International units (2). It is also interesting to note that the League of Nations Technical Commission has recommended a daily intake of 340 International units of vitamin D for pregnant and lactating women (3).

Irradiated pasteurized milk containing 135 International units per quart and irradiated evaporated milk of the same potency have been found equally effective in preventing rickets in infants. The pediatrician will be interested in the following summary taken from a recent review:

"Such evidence as is available may be interpreted to show that cod liver oil, cod liver oil concentrate milk, and irradiated milk are of equal potency for the human being, unit for unit." (1-b).

Other than the above recommendation for vitamin D intake during pregnancy and lactation (3), little definite information is available upon which to establish minimum vitamin D requirements of the human after infancy (1), yet while sunlight produces the anti-rachitic factor, most common foods are known to be deficient with respect to vitamin D (4). However, certain foods such as eggs, butter, liver and sea foods do supply this vitamin. The importance of sea foods, especially canned salmon, as carriers of vitamin D has been definitely established. A recent report on the vitamin D content of different varieties of canned salmon gave a value of 1.9 International units per gram for the least potent brand and 6 or more units per gram for several other brands (5).

From a consideration of the vitamin D values of salmon oil, the oil content of canned salmon and the quantity of canned salmon consumed annually in this country, it has been concluded that there is more vitamin D in the canned salmon sold in this country than in the cod liver oil used for both human and animal feeding (6).

Although neither the minimal nor optimal requirements of individuals of different ages are definitely known, the values of evaporated milk fortified with vitamin D and of canned sea foods as sources of this important vitamin, are well established.

## AMERICAN CAN COMPANY

230 Park Avenue, New York City

- (1) a. 1937. J. Am. Med. Assn. 108, 206  
b. 1936. Ibid. 106, 2150  
(2) 1936. J. Am. Diet. Assn. 11, 503

- (3) 1936. League of Nations Report on Physiological Bases of Nutrition, League of Nations Publication Department, Geneva.

- (4) 1935. J. Am. Diet. Assn. 11, 119  
(5) 1935. J. Home Econ. 27, 658  
(6) 1931. Ind. Eng. Chem. 23, 1066

*This is the twenty-third in a series of monthly articles, which will summarize, for your convenience, the conclusions about canned foods which authorities in nutritional research have reached. We want to make this series valuable to you, and so we ask your help. Will you tell us on a post card addressed to the American Can Company, New York, N. Y., what phases of canned foods knowledge are of greatest interest to you? Your suggestions will determine the subject matter of future articles.*

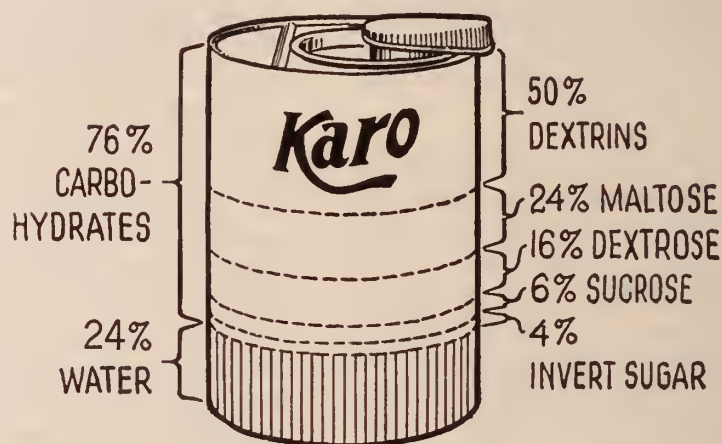


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## CONTENTS—Continued

### EDITORIALS

Medical Economics, <i>Dr. E. S. Hamilton</i> .....	282
Public and Medicine, <i>Dr. R. K. Packard</i> .....	283
Illinois Tuberculosis Association.....	285
American Neisserian Association .....	285
Berlin Bureau .....	285
Attention! .....	285
Hotel Reservations .....	285
Woman's Auxiliary .....	286

### CORRESPONDENCE

Legislative Trends, <i>J. R. Neal</i> .....	286
Morgan County Honors Dr. Black.....	287
Medical Corps Examinations .....	288
An Answer: <i>Carolyn N. Macdonald</i> .....	289
Veteran's Service Committee Dinner .....	291
Annual Meeting, Illinois State Medical Society.....	292

### SOCIETY PROCEEDINGS

Greene County .....	361
McLean County .....	361
Marriages .....	361
Personals .....	361
News Notes .....	362
Deaths .....	363

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★ *Proc. Soc. Exp. Biol. and Med.*, 1934, 32, 241-245  
*Laryngoscope*, Feb. 1935, Vol. XLV, No. 2, 149-154  
*N. Y. State Jour. Med.*, June 1935, Vol. 35, No. 11  
*Arch. Otolaryngology*, Mar. 1936, Vol. 23, No. 3  
*Laryngoscope*, Jan. 1937, Vol. XLVII, No. 1, 58-60

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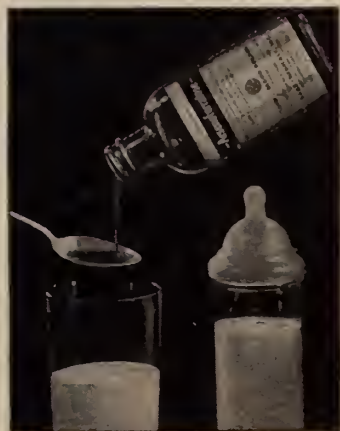
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**M**ILK MINERAL salts with a high content of milk calcium and milk phosphorus are now being regularly extracted by the Kraft-Phenix Cheese Corporation of Chicago through an entirely new process developed by this company. The analysis of these milk mineral salts, made by the Miner Laboratories of Chicago, appears above.

Through the new Kraft process, milk calcium and milk phosphorus in high concen-

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<b>KRAFT MILK MINERAL SALTS</b>	
<i>Analysis made by the Miner Laboratories, Chicago.</i>	
Calcium (Ca)	25.45%**
Phosphorus (P)	13.74%**
Ash	69.70%
Protein (N X 6.25)	16.50%
Fat	0.28%

Kraft Milk Mineral Salts also contain other mineral constituents of milk and about 7% of moisture.

*\*Since Kraft Milk Mineral Salts are a biologic product, their content varies within narrow limits.*

*\*\*In the complete product, Kraftone, the calcium and phosphorus are supplemented with calcium and phosphorus from additional milk solids.*



*Kraftone is ordinarily given mixed with milk, which makes a delicious drink, but it also dissolves readily in water. It may be taken either hot or cold.*

tration are derived from pasteurized milk—being directly extracted from the whey of cream cheese and cottage cheese.

These new milk mineral salts are being offered by Kraft in a special chocolate-flavor food drink, Kraftone. Contents and analysis of this product are given on the following page.

PAGE 1

over →



# HIGH MILK CALCIUM CONTENT OF KRAFTONE A POINT OF SPECIAL INTEREST TO PHYSICIANS

*Milk Phosphorus content of Kraft's new food drink also high. Natural Vitamin D (from fish liver oil) is added*

KRAFTONE CONTAINS:		
Maltose	Lactose	Dextrose
Dextrin	Lactalbumin	
Cocoa	Chocolate-flavor	
Vitamin D (100 U.S.P. units per ounce)		
<i>Kraft Milk Mineral Salts</i>		

THERE has long been a need for a preparation supplying calcium in a form at once highly assimilable, highly palatable and well tolerated by the gastro-intestinal tract.

These requirements are met in an unusual degree by Kraftone.

Leading nutritionists (1) have found that milk calcium was superior in assimilability to calcium from other foods and that better storage resulted when it was employed.

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(1) *Chemistry of Foods and Nutrition*, MacMillan, 1932

Units per ounce) is added to Kraftone. The source of the Vitamin D is fish liver oil.

Kraftone is a food preparation in granular form to be mixed with milk, forming a chocolate-flavor beverage. That Kraftone is delicious to the taste, highly nutritious and easily digested is evident from the ingredients used in making it.

## ANALYSIS\* OF KRAFTONE

*Analysis made by the Miner Laboratories, Chicago*

Protein (N X 6.25).....12.0%  
Fat..... 9.7%  
Ash..... 9.1%

CALCIUM (Ca) ....2.32%  
PHOSPHORUS (P)..1.56%

Crude Fiber..... 0.7%  
Carbohydrates, other than  
Crude Fiber (by difference).....66.1%  
Moisture..... 2.4%

*\*Since Kraftone is primarily a biologic product, its content varies within narrow limits.*

# KRAFTONE VALUABLE IN MANY CASES WHEN AN INCREASED CALCIUM INTAKE IS INDICATED

*Useful as a dietary adjunct and as a therapeutic agent. A special food drink well suited both to children and adults*

<i>Amount of MILK CALCIUM supplied by A GLASS OF KRAFTONE FOOD DRINK, mixed as directed</i>	
<b>WITH MILK</b>	<b>WITH WATER</b>
3 heaping teaspoons of Kraftone in 8 ounces of milk	6 heaping teaspoons of Kraftone in a glass of water
(The average household tumbler, comfortably full, holds 8 oz.; the average cup, 5½ oz.)	(Kraftone is most palatable when mixed with milk. The figures in this column are given to provide for special circumstances.)
<i>(All figures given below are accurate approximations)</i>	
0.52 Gram calcium (8.00 Grains)	0.56 Gram calcium (8.6 Grains)
<b>COMPARISONS</b>	<b>COMPARISONS</b>
The pure milk calcium supplied by a glass of Kraftone food drink as indicated above—app. 0.52 gram—is app. equal in amount to the calcium supplied by chem- ically prepared substances as follows:	The pure milk calcium supplied by a glass of Kraftone food drink as indicated above—app. 0.56 gram—is app. equal in amount to the calcium supplied by chem- ically prepared substances as follows:
61.7 Grains Calcium Lactate	66.5 Grains Calcium Lactate
89.8 Grains Calcium Gluconate	96.7 Grains Calcium Gluconate
34.5 Grains di-Calcium Phosphate	37.16 Grains di-Calcium Phosphate

AS INDICATED in the table above, adequate amounts of milk calcium can be readily administered through the use of Kraftone. It is valuable for patients of all ages when an increased calcium intake is desired.

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Aside from its special milk mineral and vitamin content, Kraftone is essentially a chocolate-flavor food drink of a type that is widely popular. For this reason the addition of it to any diet is a simple and practical matter.

Kraftone is now being placed on sale through druggists and grocers in the Chicago area. Kraft-Phenix Cheese Corporation.



*Mixed with milk, Kraftone makes a delicious hot or cold drink which appeals to both children and adults. Grocers and druggists have it in two sizes*

# Kraftone

KRAFT'S NEW CHOCOLATE-FLAVOR FOOD DRINK

PAGE 3





**"...AND ONLY LIGHT,  
NOURISHING FOOD"**

Convalescence from influenza, pneumonia and other illnesses associated with winter is a slow process, frequently requiring as much care as the acute attack. The dietary management is particularly difficult. Appetite and digestion are handicapped, yet the demand for nourishing food is increased. A diet which has proved beneficial at this time is one which supplies maximum caloric value in a palatable and easily digested form.

## **A Valuable Food in Convalescent Diets**

Ovaltine is a food supplement which fulfills all the requirements of such a dietary regimen. It was originated, specifically, as a convalescent food. It is a highly nourishing and well balanced food. Ovaltine itself is easily digested and rapidly utilized, but in addition it increases the digestibility of the milk in which the beverage is made. It also contributes to the digestion of starches.

It is palatable and helps to restore the appetite. Furthermore, Ovaltine taken at bedtime is a valuable aid in securing sound, restful sleep.

Recommend the use of Ovaltine at meals, between meals, and at bedtime during the convalescent period. It can be prescribed with confidence. Its merit is attested by over 40 years of continuous use in 57 different countries.

Your patients  
will be glad to know...

that  
*Ralston cooks  
in 5 minutes*

Of course you'll want to tell your patients that Ralston cooks in 5 minutes... because then even mothers pressed for time will gladly follow your recommendations to serve this cereal regularly. And that's important because Ralston is...

• **A WHOLE WHEAT CEREAL**...with only the coarsest bran removed... providing an abundance of the body-building, energy-producing elements that come from choice whole wheat

• **DOUBLE-RICH IN VITAMIN B**... pure wheat germ is added to Ralston to make it  $2\frac{1}{2}$  times richer in vitamin B than natural whole wheat

• **PALATABLE AND ECONOMICAL**...tastes so good that the whole family likes it — and each generous serving costs less than one cent.



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"There is no irritation experienced by the patient voiding a urine containing pyridium, as in the case with some other of the dye antiseptics. On the contrary, its action upon the mucosa seems soothing in the dilutions usually obtained."

• *Quoted from Published Clinical Reports.*

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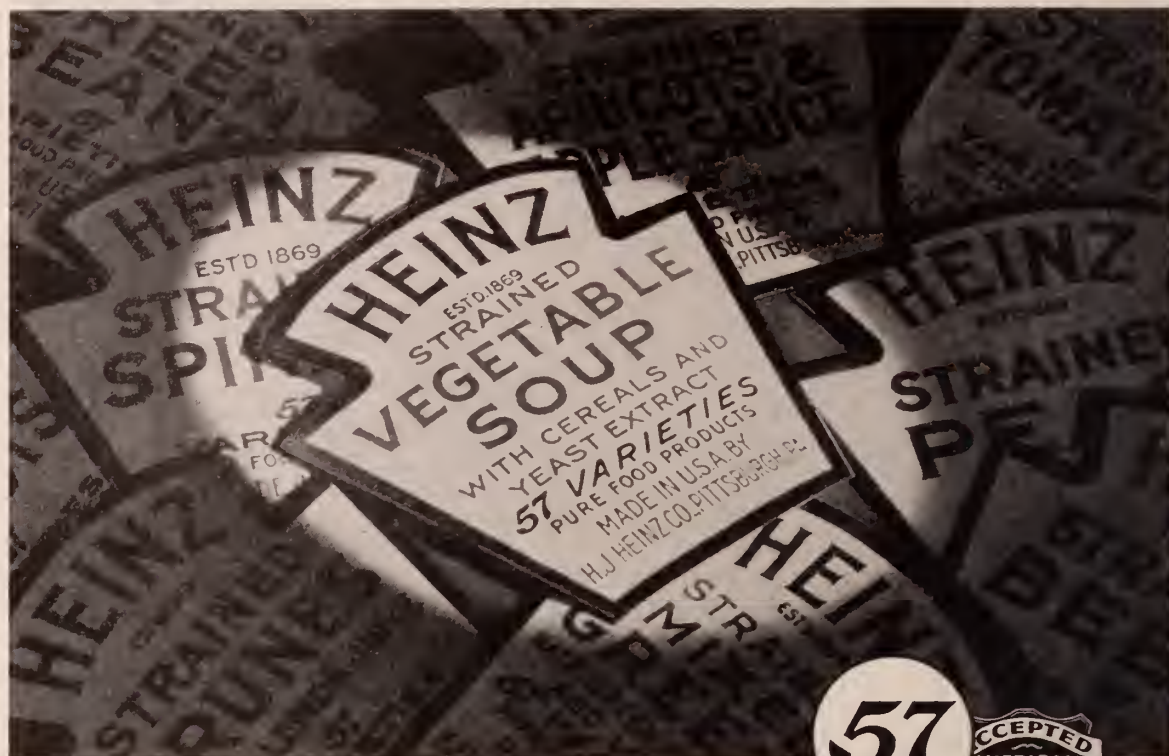
Loraga is available in 16-ounce bottles.



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# ILLINOIS MEDICAL JOURNAL

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## Editorials

### MOTOR ACCIDENTS CONTINUE INEXCUSABLY TO BE AN INCREAS- ING CAUSE OF DEATH AND DIS- ABILITY

The provisional mortality in the State of Illinois during the year 1936, attributed to motor car accidents by the State Department of Public Health, totalled 2,522 deaths for the state, as against 2,334 for the year 1935. These figures for 1936 are only a fraction less than those for 1934 when deaths from motor vehicles in Illinois totalled 2,572, in spite of concentrated "safety first crusades" launched by civic organizations and commercial concerns, such as casualty companies and motor manufacturers. This record high mortality rate in 1934 stood at a ratio of 32.6 per thousand of population, or an increase of about 3% over the previous high record of 29.5 in 1930. However, two years of intensive campaigning for "safer driving" and fewer motor accidents brought about in 1936 a saving of exactly fifty lives over the 1934 record or something like one-tenth of one per cent. That saving is not enough.

Especially when it is considered that highways are daily being improved, as are cars and motor equipment; and that in Illinois (and in many other states) license restrictions as to drivers both as to age, sobriety and general competency have been made more severe. In Chicago during 1936 there were 845 deaths by motor accident as against 858 in 1935, or a saving of thirteen lives,—one instance when the "unlucky number 13" was "lucky" for at least 13 persons. However, here again the saving *was not enough!* Chicago authorities, from police to courts, have been going rough-shod after the careless motorist. The number should have been reduced more. In 1936 one-third of all the deaths by motor accident that occurred in the state of Illinois occurred in Chicago, which is about the same ratio as for 1935. Of these deaths in 1936 it is set forth by the state figures that exactly 1,153 deaths, (of which 602 or more than half



were in Chicago), came because of "Motor Collision with Pedestrian." The second highest cause of these motor deaths was "Collision with Motor Vehicle." Of the total of 534 of such deaths, something like 14% or slightly less, or 71 occurred in Chicago. Various operating accidents, (non-collision) account for the third ranking cause or a total of 273 deaths of which only 29 were in Chicago, while "collisions with railroad trains"—the deadly grade crossing, stood fourth with 227 deaths of which only nine were in Chicago. Next came "Collision with fixed object," with 40 of these 154 deaths in Chicago, "Collision with Electric Car" while accounting for 45 deaths recorded thirty-six deaths or 80% of them in Chicago.

Chicago killed in this manner four less pedestrians in 1936 than it had done in 1935 when the record was 606. The state had 12 fewer "collisions with motor vehicles" in 1936, while Chicago had 20 less such accidents. There were twenty fewer "collisions with fixed objects" in the state and one less in Chicago. But there were 26 *more* railroad train collisions in 1936 than in 1935 though Chicago contributed only 9 of these as against 15 in 1935.

Automobile accidents were 5th ranking cause of death in 1935. Figures for 1936 are yet incomplete.

Almost 60% as many persons died from motor accidents in 1936 as died of cancer in Illinois in 1935. The one is preventable. Then why does this motor slaughter continue?

For every death by motor casualty there are to be reckoned untold disabling accidents. An evidence of the import of these is that almost any casualty company will remark "*in confidence*" that it always costs less to take care of the claim of a dead man than of one that is disabled! During the first six months of 1935 it was estimated that in Chicago alone the deaths by motor casualties were something like two per diem while the disabling accidents were practically twenty times that in their number of victims!

The *Chicago Tribune* has commented tersely upon the situation, in part:

"No disease epidemic in Chicago costs so many victims.

"The total of dead and injured for 6 months in 1935 was 8,090 casualties.

"That was as though Wheaton, the County Seat of Du Page County, had been wiped out by an earthquake *with none of its 7,258 population escaping unhurt*. . . . In addition to the 360 killed in the city this year, 89 have been killed in Cook County outside of the city limits, making a total for Cook County of 449, in the first 6 months of 1935.

"These 360 Chicago victims were not workers in a dangerous vocation with compensation for the extra hazards of their pursuits. These victims were men, women, and children with little serious desire for any more adventurous experience than balancing a set of books, baking a cake, or spinning a top. Neighborhood shopping districts and street car transfer points were the most sanguinary points. The housewife crossing from the dry goods store to the butcher shop was hit by the motorist who was on his way from his office in the loop to his home. The list of the dead does not depict all of the distress caused by these accidents. In addition to the suffering in the family of the deceased there is the sorrow of the innocent participants who survive the mishap. . . . Cursory perusal of accident reports indicates that the conventional 'stop-and-go light,' though useful in controlling traffic, can hardly be classed as safety equipment."

The *Tribune's* comments are comprehensive to a degree. The one point omitted is the *economic loss* by this useless massacre, in which not only the families of the victims but usually the hospital to which is taken this emergency case, and the physicians called in attendance are included, to say nothing of the possible and usual permanent incapacitation of the victim. The preventable accidents of peace are as deadly as the casualties of war. American casualties in the great world conflict totalled 126,000. Motor accidents in Illinois in 1935 were 1/45th of that number!

Unpreventable earthquakes in the twentieth century, according to "America," have killed 275,000 persons also, or only 100 times as many as were killed by auto mishaps alone in Illinois in 1934, and slightly less than that proportion for 1936. Many of those auto mishaps were preventable! Another way to figure it is that with a total of 84,000 fatal and some 7,350,000 non-fatal but ever-painful and frequently fright-

fully disabling accidents, in the United States, during 1934, on an average of one out of every 17 men, women and children suffer accidents annually in the United States, whilst 234,000 is the maximum of American patriots injured or wounded in the World War. Contrast that number with the total of 84,000 fatal, and 7,350,000 non-fatal accidents for 1934! And in the United States alone! In 1934, occupational fatalities in industrial establishments totalled 15,500; fatal home accidents were about 33,000; while the totals show something like 4,800,000 accidents in commerce and industry during 1934, and some 1,350,000 in homes with automobile fatalities raising the number by 35,500 fatalities; and other accidents, with disabling injuries contributing some 1,250,000 more to the grand total.

Consider the economic loss in this. It is worse than the slaughtering of live stock and the burning over and ploughing under of crops.

Gerhard Hirschfeld, in "America," has remarked:

"Just how much damage is caused by these various calamities is not known. Surely, earthquakes, floods and famines must cause damage running into many billions of dollars. But even individual accidents as cited above are very costly. In 1934 the cost in medical expense, wage loss and overhead insurance of home accidents was \$600,000,000; of occupational mishaps \$590,000,000 and of automobile accidents \$770,000,000. Thus these expenditures alone totaled nearly \$2,000,000,000 during the last year. And if the cost of accident prevention is added, there is no telling just how many billions of dollars accidents cost us throughout the year. One may obtain an approximate idea from the fact that a comparatively small item like automobile insurance premiums, totaled \$410,000,000 last year, not to mention fire, sickness, invalidity, and so forth.

"Even railroad crossings can tell a dramatic story. This country has about 257,000 highway crossings. In 1933, there were 1,511 fatalities at grade crossings, of which 1,305 involved automobiles. Between 1926 and 1932 more than 10,000 crossings were eliminated, but in the same period nearly 12,000 new ones were established. The recent work-relief appropriation sets aside about \$200,000,000 for the elimination of these traffic hazards. It is estimated that it costs

between \$30,000 and \$40,000 to eliminate a crossing, so that the elimination of all crossings would run to approximately \$9,000,000,000."

These statistics are worthy of thought and digestion by every physician, bound as he is, to make every effort within his power *to save life* and to prevent disability.

Both physicians and hospitals feel the scourge of the motor accident. The bulk of such casualties arrive in the hospital as "emergency cases." Sometimes the hospital bill is paid, more often not; and what happens to the doctor in 70 cases out of one hundred is yet another sad story. The medical profession should join with traffic experts and legislators to plan a method to curb the plague of the malicious automobile.

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### AMERICA DOES NOT NEED, AND DOES NOT WANT, A MEDICAL SYSTEM RUN BY NON-MEDICAL PERSONS

Medicine is becoming a matter of clerical capacity rather than of scientific scope in that birth-place of compulsory health insurance or state controlled medicine,—Germany.

For the United States the attitude towards compulsory health insurance or state medicine should be that same which counselled the mariner against the legendary Lorelei.

"Sailor, *beware!* Trust her not, she is fooling thee."

Begotten in the brain of Bismarck, the "man of blood and iron," or "The Iron Chancellor," state medicine is a plush horse upon which a scheming bureaucracy rides ruthlessly into public power and destruction of that same public which supports it.

In present-day Germany, where the highly-developed mid-nineteenth century idea of the Bismarckian doctrine prevails in arrant apostasy against the rights of science and the welfare of civilization, *it is an open secret that doctors are decreasing in number and bureaucratic clerks and functionaries so increasing that already in the national medical system the clerks outnumber the physicians.*

In other words, for every doctor who cares for the sick and ailing there are a great many more lay clerks who take a hand in the game.

Quoting from a report issued by the League of Insurance Physicians of Germany it is noted that:



"According to a report under date of July 1, 1936, there were 30,559 insurance *doctors* employed in the Third Reich as against 32,620 *physicians* so employed in 1933, or a *decrease* of 2,061 *doctors* against the fact that in 1936 the number of insured persons had *increased* by *more than* 2,000,000!

"And further, according to the German National Bureau of Statistics the lay or administrative personnel of the sick insurance societies shows a steady increase. For example, in 1934 this lay, administrative personnel numbered 35,635 persons and in 1935, this same department numbered 36,229 persons!

"In other words, the lay personnel *increased* by approximately 600 persons in one year; the physicians *decreased* by about 2,000 and the *increase* in *additional* patients was approximately 2,000,000."

This increase in lay control would seem to have kept pace with the growth of sickness insurance in Germany. As has been explained both editorially and elsewhere in this magazine for nearly twenty years "sickness insurance," "State medicine," and "Compulsory Health insurance" all grow on the same stalk. No matter what their species, the genus is identical. They sacrifice science to politics, and medical skill, progress and public welfare to a lay bureaucracy.

It is well understood that there is in preparation now by proponents of health insurance, state medicine and all other varieties of that noxious family,—an overwhelming mass of propaganda aimed to promote in this country compulsory health insurance legislation patterned after the system in effect in Germany, England and other European nations and which is spelling disaster every day. For wherever health insurance or state medicine prevails, there by statistics, by word of mouth and by simple observation it is learned that the public health is far below that standard existent today in the United States. In view of this condition why should the United States, simply because the system has been "made abroad" and emanated from economic and personal standards absolutely at variance from our own, adopt a medical system *run by clerks and not by doctors*? Why should the health of the American people be at the mercy of a set of public employes who do not know the difference between measles and typhoid fever? It is not within even the miracles of

science to make an extra pay-roll tax do efficient duty for scientific medical service, which in the end is about what the system of mass medicine certain wire-pullers have set to brewing. The workingman, ay, all of us, if such a monstrosity is foisted upon the country will be finding our bill for "medical service" expanded so as to include the hire of the lay employes concerned with the system,—i. e., the clerks, stenographers, book-keepers, supervisors, supervisors' chauffeurs, motor expenses, statisticians, health study "experts(?)" statisticians, ward workers, theorists, snoopers, arguers and propagandists. Why not let things run as they are, and pay what is to be paid to the doctor and not to the neighbors who are too lazy to work, which is about the truth of the place from which this army of bureaucratic parasites will be recruited? Why dismiss the doctor to give the next-door neighbor a job? That in a nutshell is what happens under health insurance!

Under the bureaucratic system of state medicine the doctor will vanish and the clerical staff reign supreme.

Such a state of affairs is not medicine.

It is un-American.

When American citizens want medical care, they want medical care and not ignorant hearsay. "All that a man hath will he give for his life." It will be a sad day indeed for this country when a man gives *his all* in government exacted tithes and finds that in return he receives *not* the best of medical service but only a few tax receipts for the hire of a lay personnel.

Truly America does not want, and does not need a medical system run by non-medical persons!

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#### UNDER THE PANEL SYSTEM CURRENTTMENTS ARE THROWN IN WITH A YEAR'S GENERAL TREATMENT FOR \$2.25 PER CAPITA

One of the ablest of the recent articles decrying the panel system of medicine was published in the medical economics section of the Journal of the American Medical Association under date of Nov. 2, 1935, and had for its author, Dr. Edward F. Klein of Perth Amboy, N. J.

At the outset Dr. Klein states that he bases his article on his own experiences and contacts in Germany, Austria, France and Great Britain

and on "personal talks with physicians working under the panel scheme in their respective countries. . . . Many statements are excerpts of panel laws and are consequently true to the crude facts."

If this copy of the Journal of the A. M. A. has left your desk, and if you have not read this article of Dr. Klein's, it will pay every physician to secure a second copy or at least a re-print of the article. For, without doubt, its narrative is correct in every detail.

From perusing this article any physician, no matter if he leans towards a subsidized system of medicine, cannot fail to perceive that under the best of such systems, and Great Britain is held to have the most modern with the most improved of gadgets, the doctor becomes the buffer state between patient and government. The physician's privileges are perfunctory. Those of both patient and government are protean.

Remember that the National Health Insurance Act of Great Britain that took effect in 1912 requires those approximately 19,000,000 employed persons in the nation to take part in a scheme of state insurance for health purposes, with the exception of those whose remuneration exceeds £250, or some \$1,250 per year in American money. Now the county insurance committee that governs the conduct of physicians is composed of only *one-fifth medical men*. The other four-fifths are lay members. Among those who can claim care on any physician's list are, "those assigned to him by the insurance committee; applicants whom any other physician does not wish to accept, and applicants on the list of a physician who may not be available."

The average number of patients on a physician's list in Great Britain totals 961, according to Dr. Klein, and the average per capita payment for a year's treatment is *nine shillings or \$2.25 per annum*.

The keeping up of involved records is an additional burden upon the physician as well as a possible cause, among others, for charges of neglect, which may bring in their train penalization with possibilities of a fine ranging from \$5 to \$500 and the further penalty of removal from the panel.

Within the insurance contract come such medical treatments, with stipulation that no additional fee shall be charged as "1. arrest of hemorrhage from the gums, 2. extraction of a

tooth under an anaesthetic, 3. tapping of hydrocele, 4. removal of cyst in neighborhood of knee, 5. removal of fibro-adenoma of breast, 6. operation for cellulitis, 7. removal of needle from foot, 8. amputation as cure for hammer toe, 9. taking blood for Wassermann test, 10. treatment of fracture of both bones of the leg with dislocation, 11. treatment of gonorrhea, 12. curettement of uterus, 13. operation for fissure in ano; operation for deep abscess of the neck, 11. dislocation of the elbow and reduction under chloroform, 15. removal of epithelioma of the lip.

What American doctor would want to be held liable to perform even any one of those tasks under a lump per capita sum of \$2.25 per year? And under government inspection at that? Yet this is a sample of the workings of "state medicine" and the panel system in Great Britain.

#### HOW MANY NEED HELP?

Within a small margin of error, about 50 per cent of the population goes through the year without any illness. Fifty per cent of the illnesses of the other half are not disabling. One half of the remainder, or about 12½ per cent, are of a minor character, such as the common cold and involve a disability of less than a week. This leaves about 12½ per cent who have serious illness and an expense for wage loss and for medical care sufficient to constitute a real problem. Of these, many are able to meet the necessary expense from their own savings, by deferred payments or from regular income, just as they meet other extraordinary expenses. Thus it seems reasonable to assume that 5 per cent—certainly less than 10 per cent—of the total population are unable to meet their sickness expense without great sacrifice. This is still enough of a problem always deeply to concern organized medicine.

It is a testimony to the accuracy of these figures that when county medical societies have set up machinery to provide medical service for those otherwise unable to obtain it the number served has almost invariably been between 3 and 5 per cent of the total population.—*Jour. A. M. A.*, Feb. 20, 1937.

#### FOR WHOSE BENEFIT?

Every proposal for change in medicine should be tested with the question "For whose benefit?" Unless the change will help, either directly or indirectly, in the fight against disease and death, it cannot be justified. The fact that it may increase the income of physicians, help pay the interest on hospital investment, or provide salaries for a body of administrators, unless it will also improve medical service, is no justification. This is a simple test, but applied strictly to many of the proposals for medical changes before the public at the present time it would elicit a verdict of condemnation.—*Jour. A. M. A.*, Feb. 20, 1937.



## MEDICAL ECONOMICS

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Edited by the Committee on Medical Economics  
of the

Illinois State Medical Society  
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Kankakee, Illinois

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C. B. Reed, M. D.  
C. S. Skaggs, M. D.

Address all letters and communications to the Chairman.

The great amount of publicity given at present to the Supreme Court and Sit Down Strikes is further evidence of the unrest of the nation, as well as the extremes to which alterations are being proposed in our economic and social structure not to mention the basic principles of our government. If at present, little or no attention is being directed to the medical profession and the care of the sick, we should not believe that the entire problem has been forgotten. After all this problem of medical care is but a small affair in these days when the fundamental principles of our government are being threatened and can be relegated to a later date. This is all to our advantage, for it gives us additional time to study ourselves and our problems. In addition we have time to continue the program of education of the medical profession, those who participate would times, it seems that the medical profession shows less interest in the question than the public, at least so far as the demand for speakers at meetings is concerned. There is work for everyone and there should be at least one or two men in every medical society able and willing to address small meetings in his home town as well as those in the near vicinity. It is asking a lot for a man to travel a hundred miles to talk to 20 to 25 people. This would be a good opportunity for the younger men to become interested in the subject and carry the message to their neighbors. In addition to the value of this work to the entire medical profession, those who participate would receive a wide acquaintanceship with the laity.

The agreement with the Federal Resettlement Administration, in regard to medical care for their clients, has been delayed for some time due to lack of definite information in regard to the number of so-called clients and the emergency of the flood in Southern Illinois with a great increase in the number of farmers on relief in that part of the state. At the March meeting of the Council it was voted to continue the work of the

Committee headed by Dr. Neal. This committee will report at the next regular meeting of the Council. Meanwhile the Counties in southern Illinois in the flood area were voted permission to make any arrangements they thought necessary and were able to accomplish, so that the destitute would receive adequate care and the medical profession receive some compensation for their work.

This committee has been informed that the Resettlement Administration made an effort to make arrangements for the dental care of their clients through the Illinois State Dental Society and that the Dental Society refused to enter into any arrangements for care at reduced prices. We have not heard of any State Medical Society making a contract for this work.

As the time for the annual meeting of the Illinois State Medical Society approaches, we hope that there will be a program of special interest on subjects of economic interest. Any of the members of the Illinois State Medical Society who has the desire to present some phase of this great question will have the opportunity. At least, those men interested in the subject will have a place to meet and talk over the question with other men interested in the same thing. The exact time of this meeting is not known to the Chairman of the Committee, but every effort will be made during the next month, to be able to give the exact information in the next issue of the ILLINOIS MEDICAL JOURNAL.

The President-Elect of the Illinois State Medical Society, Dr. R. K. Packard of Chicago, has written an article on "The Public and the Future of Medicine." This is presented in this column, immediately following this article. Dr. Packard has been interested in this subject for many years and has the ability to present his opinion and ideas in a simple, definite and pleasing manner. I hope every medical man in Illinois reads the article.

E. S. HAMILTON,  
Chairman of Committee.

## THE PUBLIC AND THE FUTURE OF MEDICINE

R. K. PACKARD, M. D.

One looks into the future, at the present time, with considerable query as to just what is going to take place; what the present trends are; and perhaps why these things are taking place; and why we pass through certain trends.

One can hardly forecast the future, because one cannot definitely forecast our statesmen, our business leaders, our educational leaders, our professional leaders, our labor leaders, our reformers at large, or the public as a majority or minority group.

I find men of almost every class, who are almost ferociously for the New Deal and I also find men of almost every class who are ferociously against the New Deal. I also find men, strange as it may seem, who are for Mr. Roosevelt and against most of the New Deal. I also find doctors who are opposed to any socialization of medicine who are for the New Deal and equally interesting I find business men opposed to the New Deal who favor some form of social medicine.

I think we all agree that whether we like the trend or not we are moving in a certain direction, and the direction is toward a more Centralized Government.

Fundamentally as an individualist I am opposed to it, and I think collectively thinking, I reach the same conclusion.

If there is at present a definite social, labor, economic, political and industrial trend then I think the practice of medicine is going to move with that trend. It is difficult to understand how one part of our social economic order can keep out of the current. It is obvious that it is in the current now because for many years the private practice of medicine has given way to other forms of practice and an ever increasing tendency to public health services of various kinds. Many people say, we would not have these social, political and economic upheavals, unless something was wrong, and if something was wrong; there must have been mismanagement, and if there was mismanagement, it must have been among the higher ups in our political and economic order. The young Republicans demanded a new Republican party and many old Democrats demanded, what they called a return to the Democratic party. Some forward looking business men have

sensed a need for a change in business management, and I dare say some would like to return to the old days. Was the World War and its after effects entirely responsible, as some would have you think, or was our recent and perhaps present upheaval the result of Internal Affairs? Whatever may have been the causes, we must remember that this was not our first depression and that leads us to the fact that our periods of prosperity and depression come and go, and that with each one we have new trends in our political, economic, educational and labor order. Medicine has never passed through one of these trends without some changes.

The great industrial development brought about, almost of necessity, contract practice. It brought about in large centers the necessity of better supervision of contagion. It brought about our great charity hospitals, our free clinics, etc. The Workmen's Compensation Laws brought about insurance practice to the injured employee, and the right of the employer to select a doctor for the injured and the Insurance Companies to some degree have set the fee.

In the present trend we have already found the Federal Government paying for medical care for those on relief. We find appropriations for maternal welfare, for the treatment of syphilis, for the care of crippled children, etc. We are and have been, obviously, in the current of social and economic changes.

The problem is not so much a question as to whether these changes have been justified but rather one, that they are taking place, and are going to continue to take place in the current trend, unless that trend changes, or unless the medical profession can sell the American People, our business leaders and politicians, that the continuance of such a trend will in the end result in a poorer type of medical service than is now enjoyed by the public as a whole.

If we are to assume or admit that there has been mismanagement, by our political and industrial higher ups, that has resulted in repeated trends, over the last 125 years, in causing periods of prosperity and depression, affecting our social and economic order, can we assume or admit that such has been the case in medicine.

While I am of the opinion that these trends cannot entirely be obviated, because of our constant changes due to new discoveries in every field, which constantly bring new economic prob-



lems to the fore, and are after all the sponsors of real progress, I am equally of the opinion that certain policies can and should be better controlled; first by our economic leaders, and second by governmental regulations, where leadership fails in its stewardship.

Most of our social economic laws have been the result of a necessity to regulate when leadership has failed. Such is the history of the right of labor to collective bargaining; such is the history of our workmen's compensation; such is the history of child labor laws; such is the history of our securities law.

Have the leaders of medicine been guilty of a betrayal of their trust? I think not. They, themselves, have led the campaign for better medical schools, more rigid licensing boards, compulsory interne training, better standards for hospitals, better post-graduate work, the standardization of drugs, the dissemination of knowledge through their publications. They have at all times led the way and the rich and poor have ever profited by the progress in the art and science of medical care.

One asks, is the practice of medicine perfect? I for one answer no. We have our problems, and I believe we are seriously attempting to correct them. Are they easy of solution? No, they are not, because they are but a part and parcel of our whole economic and social problem. As long as we have indigents, the very poor and the low income group, there will be an economic problem in rendering medical care. Now, the medical profession cannot control indigency, cannot control the very poor and cannot control wages affecting the low income group. That is the problem of our economic leaders, and I am of the opinion that neither the economic leaders or political leaders can legislate an economic level. Medicine has answered its call for many years to these groups and as far as I can determine will continue to do so until the privilege is legislated away from them. They accept their responsibility, and man our charity hospitals, our county hospitals, our free clinics, our free dispensaries, and meet the obligations, as far as is within their power, of their stewardship.

Is it possible for the public to profit by any radical change in our present system? When such changes have been tried, at the heed of the politicians, they have not proved advantageous.

I would not have you think, that some or per-

haps all, of our political leaders are not sincere, and the same for our social leaders, in a belief that improvement can be made. Sincerity does not always mean right and does not always signify facts. Experience should be our great teacher.

The future of the practice is going to depend largely upon what the people demand, or are promised in this present trend toward social and economic security, in all that it implies in the so-called full life.

Education is after all our great hope in all conflicts. But education put to work at the wrong job is dangerous. There are those who are attempting to educate the public that much is wrong with their medical care, and sometimes educated men think and talk only on their side and fail to be guided by established facts from experience.

Let us recognize as a profession that we do have some problems; let's attempt to educate the public, political, social and economic leaders of our problems, and that we are settling them within our own ranks. Let us not always denounce criticism or assume that we are all above it. Let us sense that we are in a changing world and that just as the science of medicine has changed, so have the conditions under which we must render medical care changed. Let us ask ourselves, am I doing the best possible job that I am capable of in rendering medical care? Am I doing sufficient studying to keep in step with the march of medical progress? 120,000 doctors are daily molding public opinion. It is our individual job to mold public opinion so that they will not want a change. Someone says, "Oh, they will want a change, anyway, what's the use of trying?" I can only say that if we are sincere in our principle it is no disgrace to lose fighting, but it is a disgrace to be an individual quitter or not to stick out, to the end, with the rest of the team.

Trends swing swiftly in our social and economic order just as they do in a football or baseball game and sometimes the third quarter or the ninth inning brings a victory that looked like a ten-to-one chance of defeat. And so, we may witness in the not distant future another trend, that will, if we stick to our task and to our public, safeguard us and the public from any change that we honestly think would be detri-

mental to medical care. And should we experience such a trend, we must not become the complacent old man, but we must delegate ourselves to the task of the continued study of rendering adequate medical care to the people both in times of prosperity and depression.

If the trend does not change and we are drawn into the full swing of the current, then all we can hope to accomplish is to guide the trend we are forced to take to secure the best for the public and the profession.

### ILLINOIS TUBERCULOSIS ASSOCIATION

#### MEDICAL PROGRAM ANNUAL MEETING

Presiding—H. R. Searle, M. D., President, Winnebago County Tuberculosis Association

Crystal Room

Nelson Hotel, Rockford

Tuesday, April 20

9:00 A. M.—“An Analysis of Scientific Case-finding Methods”—D. O. N. Lindberg, M. D., Medical Director and Superintendent, Macon County Tuberculosis Sanatorium.

9:45 A. M.—“Tuberculosis in Apparently Healthy Individuals”—Robinson Bosworth, M. D., President, Illinois Tuberculosis Association.

10:10 A. M.—“The Responsibility of Sanatorium Boards for Promoting Early Diagnosis of Tuberculosis”—N. C. Bullock, M. D., Commissioner of Health, Rockford, Illinois.

10:30 A. M.—“The Importance of Standard Technique in Administering the Tuberculin Test—Description of Technique”—Bert Moore, M. D., Medical Director, Tuberculosis Dispensary of Vermilion County.

Discussion Leader—F. R. Martin, M. D., Assistant Medical Director, Macon County Tuberculosis Sanatorium.

11:10 A. M.—“The Importance of Standard X-ray Technique—Description of Recommended Technique”—Vincent B. Marquis, M. D., Medical Director, Fairview Sanatorium, Normal.

Discussion Leaders—H. D. Fast, M. D., Medical Director, Oak Knoll Sanatorium, Mackinaw; D. O. N. Lindberg, M. D., Medical Director, Macon County Tuberculosis Sanatorium.

12:15 P. M.—Annual Meeting, Winnebago County Tuberculosis Association.

Speaker—L. A. Myers, M. D., Minnesota—Subject to be announced.

Delegates invited to attend.

#### Afternoon Session

Presiding—A. L. Nickerson, M. D., President, Kankakee County Tuberculosis Association.

2:15 P. M.—“The Problem of Case-finding Among High School Students”—Allan J. Hraby, M. D., Secretary, City of Chicago, Municipal Tuberculosis Sanatorium Board.

Discussion Leader—Winston H. Tucker, M. D., Co-

ordinating Epidemiologist, State of Illinois, Department of Public Health.

3:15 P. M.—“Organizing and Conducting Scientific Case-finding Demonstrations Among School Teachers”—Arthur S. Webb, M. D., Wheaton, Illinois.

Discussion Leader—F. M. Meixner, M. D., President, Peoria County Tuberculosis Association.

4:00 P. M.—“The Problem of Tuberculosis and Case-finding Among College Students”—J. Arthur Myers, M. D., Minneapolis, Minnesota.

6:30 P. M.—ANNUAL BANQUET.

“Annual President's Address”—Dr. Robinson Bosworth.

“The Menace of Tuberculosis in Young People”—J. Burns Amberson, Jr., M. D., Visiting Physician, Bellevue Hospital, Tuberculosis Service, New York City, and Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University.

### ANNUAL MEETING OF THE AMERICAN NEISSERIAN MEDICAL SOCIETY

The third annual meeting of the American Neisserian Medical Society will be held on June 8, 1937, in the Senator, Atlantic City.

The program will consist of papers and discussions of the various phases of the management and control of gonorrhea. All who are interested are cordially invited to be present.

The meeting will begin promptly at 10:00 A. M. and will continue through the day.

### INFORMATION BUREAU FOR PHYSICIANS IN BERLIN

“In “Kaiserin Friedrich-Haus,” Berlin NW 7, Robert Koch-Platz 7, connected with the Academy, there is a bureau of general information for physicians which will, gratuitously and with strict impartiality, answer all questions pertaining to matters of interest to physicians. Every foreign physician intending to come to Berlin is urged to get in touch with this Information Bureau (Auskunftei) Berlin NW 7, Robert Koch-Platz 7, either by writing or by personal call, so that the Bureau may draw up for him a plan for the most profitable utilization of the time at his disposal. Besides, this Information Bureau is prepared to provide him with letters of introduction to clinics, institutes, etc., in Berlin as well as in other parts of the country.

#### ATTENTION!

The Alumni Association, College of Medicine, University of Illinois, invites all of its Alumni to luncheon Wednesday, May 19, at Peoria. Details in May ILLINOIS MEDICAL JOURNAL.

CHARLES H. PHIFER, M.D., *President.*

### MAKE HOTEL RESERVATIONS EARLY

1. Dr. W. A. Malcolm, Chairman of the Hotel Committee, suggests that hotel reservations for the meeting of May 18-19-20 should be made early.



2. There will be a golf tournament with prizes Tuesday morning, May 18, at the Mt. Hawley Country Club. All those who wish to enter, communicate with Dr. Wm. Major, Peoria, Ill.

#### WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

We extend our hearty congratulations to the newly organized Montgomery County Auxiliary and success to them and their new officers.

Officers: President, Mrs. E. T. Douglas, Hillsboro; Vice-President, Mrs. H. F. Bennett, Litchfield; Secretary, Mrs. Harry A. Yeager, Litchfield; Treasurer, Mrs. J. R. Rebillet, Litchfield; Historian, Mrs. Geo. A. Telfer, Hillsboro. Yours truly,

MRS. V. M. SERON, *Chairman,*  
*State Press and Publicity.*

### Correspondence

#### LEGISLATIVE TRENDS IN ILLINOIS

J. R. NEAL, M. D.  
Chairman, Legislative Committee  
SPRINGFIELD, ILL.

No definite trend of thought has been revealed in legislative activity at Springfield, although the Sixtieth General Assembly has been in session for more than three months. On the contrary, much confusion prevails. Out of 832 bills introduced up to March 27, only 8 had become law. Less than one-third, 274, had been acted on by committees to which the bills were assigned. A great deal must be accomplished, however, before adjournment in June. Much legislation will be offered in order that Illinois may qualify for the innumerable grants in aid offered by the Federal Government under the provisions of the Social Security and other laws. Appropriate action along these lines, which involve sociological problems of the first magnitude, will demand the most careful consideration and a great deal of deliberation on the part of the General Assembly.

Thus the legislative calendar is sure to be seriously crowded during the next three months. Action on many proposals is likely to be hasty and confused. Almost anything may happen under such circumstances. Selfish interests are alive to the situation. Already they are active. Alertness on the part of good citizens generally, and especially the medical profession, is imperative if the enactment of ill-advised laws disadvantageous to the public are prevented.

Endorsed with "Do Pass" by the Committee on Licensure and Miscellany, for example, are two bills requiring the licensure of chiropractors which went to first reading in the Senate on March 24. Introduced on March 3 by Senator Kielminski, one of these bills, S. 171, would set up an independent chiropractic examining committee, while S. 172 would require the licensure of chiropractors through the functioning of that committee. The prompt and favorable action of the Senate committee indicates substantial support back of these bills. Of even more significance, it indicates a tolerant attitude in the minds of legislators toward the provisions of these proposals.

Similarly, H. 194, introduced on February 16 by Representative F. W. Lewis, would set up an independent examining committee of and for osteopaths. While still in the hands of the committee on Efficiency and Economy, this measure is a threat to the integrity of high standards in medical practice in the State. So cunningly was the clause relating to osteopaths inserted in this bill that it escaped the notice of several seasoned reporters whose business is to cover pending legislation. The bill purports to be a well advised effort to amend the Medical Practice Act with a paragraph on osteopaths incidentally included.

Scarcely less important to medical practice than these three are S. 111 and S. 136, which would require the annual registration of x-ray operators. Here again an independent examining committee would be established, thus lifting a subsidiary function of medical practice to the level of the profession itself. If x-ray operators are licensed and set up as an independent profession, the next logical step would be to register and establish as independent professions each of the other classes of technicians in diagnostic and research laboratories, such as bacteriologists, serologists, parasitologists, chemists, etc.

A dozen other bills now pending relate to the registration and licensure of various occupational groups. Watchmakers, horticulturists, street railway motormen and conductors, motion picture projectionists, painters, restaurants and hotels of less than 50 beds would be brought under annual registration requirements by these measures. New and revised laws concerning the licensure of barbers, chiropodists, optometrists and plumbers are pending. All

such measures require the closest scrutiny and consideration in order to detect provisions of considerable medical importance that may be present. Proposals requiring licensure are likely to be looked upon with tolerance if not with positive favor by legislators because of the revenue producing features. This factor is especially attractive now when new sources of taxation are sought with vigor. Annual registration fees swell the revenue and make room for new government jobs.

Bills proposing legislation of a desirable character require careful consideration for two reasons. Firstly, a proposed law must have strong support to insure passage. Secondly, bills may be so drawn as to defeat their purpose. H. B. 114, for example, which the committee on Public Health has endorsed with "*Do Pass*," would require the medical examination of all persons about to marry. The laudable purpose is the control of venereal diseases. It specifies, however, that Wassermann or Kahn tests shall be made by physicians and it sets a maximum of \$2 for the medical fee for the examination. These provisions would make difficult the efficient enforcement of the proposed law.

Another piece of desirable legislation is represented by S. B. 8. This measure would give to physicians and hospitals for services rendered a prior lien on damage awards in personal injury cases. The purpose is to create legal machinery for insuring that money awarded by courts to accidentally injured persons goes toward the payment of medical and hospital expenses incurred on account of the injury. Although this bill was introduced by Senator Crisenberry on February 2, it is still in Committee.

Out of the 832 bills that had been introduced up to March 27, no less than 165 relate more or less directly to medical practice. They embrace provisions concerning licensure, hospitals, sanatoria, sanitation, foods and drugs, health departments, poor relief, workmen's compensation, safety, education, traffic regulation, ambulance chasing, taxation, etc. Your Legislative Committee has sifted these out from the general offering, has studied carefully each bill and has kept the medical profession informed of the situation.

The importance of maintaining active and aggressive interest in legislative matters cannot be over-emphasized. Public opinion governs the trend of legislation and public opinion is subject

to change on all subjects. This has been illustrated recently in respect to prohibition. North Carolina, for example, enacted a local option law and Kansas legalized the sale of beer. These two were among the strictest of the bone dry States where the dry sentiment had been built up solidly and militantly. A decline in the leadership of the dry cause, coupled with persistent work by the wets and a growing up of a new generation, made vulnerable the sentiment favorable to prohibition.

The medical practice act in Illinois was enacted in 1877 as a result of work done by the medical profession. The standards of medical practice have been raised and maintained and the public health service of the State has been improved through the aggressive leadership of physicians. That leadership must be maintained in order to keep secure the advancements made in the past and to improve in the future.

Under our form of government, the most vocal elements in the population are most likely to exercise the greatest influence over legislation. The general trend of thought in legislative matters is toward cooperative action and greater governmental participation in welfare and economic practice. Medical services are at the very heart of welfare practices and must inevitably be the subject of an increasingly large volume of proposed legislation. Without the interest and guidance of those with training and experience in the field of medicine and public health, the laws that may be enacted will often be ill-advised and impractical. Let the medical profession be ever on its guard in behalf of legislation in the interest of the public and of good medical practice.

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#### MORGAN COUNTY TO HONOR DOCTOR BLACK

*To the Editor:* The Morgan County Medical Society will honor Dr. Carl E. Black of Jacksonville, Illinois, on April 29, 1937, on the occasion of his fiftieth anniversary in the practice of medicine. The celebration program will be held at Baxter Hall at Illinois College at seven o'clock.

Speakers will include Drs. William Allen Pusey, former president of the American Medical Association; Roland L. Green, President of the Illinois State Medical Society; Fred Bailey, President of the Western Surgical Association; Arthur D. Black, Dean of Northwestern Univer-



sity Dental School; Loyal Davis, Professor of Surgery at Northwestern University Medical School; Kellogg Speed, Associate Professor of Surgery at Northwestern University Medical School; C. U. Collins and E. B. Montgomery.

It is not often that an organization has opportunity of seeing one of its members round the half century mark in his profession. The Morgan County Medical Society has that privilege in that Doctor Carl E. Black will have been practicing medicine in Jacksonville, Illinois, fifty years on April 29, 1937. We are endeavoring to help him celebrate that occasion by arranging a meeting in his honor.

The program will consist of two scientific papers at five o'clock at "Old Beccher Hall" at Illinois College followed by an anniversary celebration dinner at seven o'clock at Baxter Hall at Illinois College. This after dinner program will be of a general nature and open to anyone who may wish to attend.

Will you please notify your members so that as many as wish may attend this meeting. We will appreciate it also if you will have your society, or president, designate one member who will be present and serve as your official representative.

Among the speakers who have already accepted our invitation to be present and take part in this program are William Allen Pusey, former president of the American Medical Association; Roland L. Green, President of the Illinois State Medical Society; Fred Bailey, President of the Western Surgical Association; Arthur D. Black, Dean of Northwestern University Dental School; Loyal Davis, Professor of Surgery at Northwestern University Medical School; Kellogg Speed, Associate Professor of Surgery at Northwestern University Medical School; C. U. Collins; E. B. Montgomery.

We believe that Doctor Black deserves this recognition and are doing our best to have a fitting program on the occasion of his anniversary on April 29, 1937.

Will you please advise us whom to expect as the representative from your society.

Respectfully,

George L. Drennan, M. D., Chairman,  
F. Garm Norbury, M. D.,  
Friedrich Engelbach, M. D.,  
Committee of Morgan County Medical Society.

## COMPETITIVE EXAMINATION FOR THE MEDICAL CORPS OF THE U. S. NAVY

*To the Editor:* The Medical Corps of the United States Navy offers a number of internships and commissions to graduates of Class "A" medical schools. Examinations will begin on May 10, 1937, and applications should be on file at least one month prior to that date.

*Commissions.* Qualified candidates who have completed internships in civilian hospitals will be commissioned as Assistant Surgeons with the rank of Lieutenant (junior grade) and assigned to the Naval Medical School, Washington, D. C., for a postgraduate course of instruction.

*Internships.* Senior medical students who qualify for appointments to internships in Naval Hospitals will be appointed Acting Assistant Surgeons with the rank of Lieutenant (junior grade) for temporary service during the interne year, and upon satisfactory completion of internship will be allowed to appear for competitive examination for permanent appointment. Should an interne desire to return to the practice of medicine in civil life, his appointment as an Acting Assistant Surgeon will be terminated and he will be honorably discharged from the Naval Service.

*Qualifications.* Candidates must be United States citizens between the ages of 21 and 32 years at the time of appointment, and pass a physical and professional examination. The physical requirements comprise the following: Height—66 to 76 inches, inclusive; robust physique and development; weight—proportionate to age and height; hearing—normal; vision—not less than 12/20 each eye unaided by glasses and capable of correction to 20/20; color perception—normal; teeth—not less than 20 vital teeth, of which there must be 4 opposed incisors and 4 opposed molars.

*Compensation.* Officers of the rank of Lieutenant (junior grade) without dependents receive compensation of \$2,699 per year, while those with dependents receive \$3,158 per year. There are additional cash allowances.

If interested, write at once for further particulars to

Bureau of Medicine and Surgery,  
Navy Department, Washington, D. C.

## AN ANSWER TO "WOMEN AS SLAVES IN INDUSTRY"

Chicago, March 24, 1937.

*To the Editor:* We are expected to recognize etiologic factors; accordingly I am moved to answer Dr. Harger's "Women as Slaves in Industry" although it would be much easier to remain quiet. It is poor advertising for a profession, well able and clamoring for the right to adjust itself to changing economic conditions without interference from lay groups, to overlook some of the major trends, economic and social, that have brought us to our present way of doing things. And to cry out for a return to the old way, however, easier it may have been, exhibits an inability to stand up before the uncertainties and vicissitudes of modern life. All of us would prefer to see our idle men and boys swept off the street back into paying jobs, so that they might establish and support homes and children while they are still young and virile. In my opinion, replacing 5,000,000 women in industry by men would not accomplish this as I shall attempt to show; nor may we cherish the hope that these women so released would create more and better homes because the economic requirement of the home has been irrevocably changed.

Women did not come suddenly into gainful occupations nor entirely of their own accord, nor do all remain there willingly. Inventions, new machines, mass production, new ways of doing things and, yes, even new beliefs have grown out of what was thought to be necessary. These forces, operating for at least sixty or seventy years, have profoundly affected the home and woman, the pivotal point in the home, has borne the brunt of the changing times. We may think her presence in industry contributes to prolong the depression, but major economic forces that placed her in industry started many, many years before the depression was suspected as a possibility. For the majority of women a home and children will always be the foremost urge, but in order to satisfy this longing her pay envelope is needed to bolster the average family budget which is weak in the face of modern demands.

In former days the housewife had plenty with which to occupy her time and provide an outlet for her creative urge—soap and candle making, weaving and spinning, cupboards yawning for

jellies and preserves, cellars for home cured meats, clothes for men and women to be tailored, and an ingenious woman could weave a flour sifter from horse hair. A man might earn a very small stipend but the magic hand of such a wife could stretch his dollars with such wizardry as to make a General Motors expert envious. Today all this work has been taken from the home by the machine, and the modern housewife buys canned foods far more cheaply than she can prepare them; her clothes ready made—and in fetching styles—are purchased at the cost of the materials; the laundry is cared for in the wet-wash; and the final deterioration of her job is manifest in the diaper wash. Cheap and skillful action of the machine has thus replaced her in the home. It has taken from the housewife and the homemaker the joy and opportunity for expression that was in her work, and also has robbed her of a dignity and self respect that goes hand in hand with housework well done. But what has been more effective in forcing her into industry is that food, clothing, furniture, and even amusements—formerly made at home and by hand—must now be paid for in dollars, actual cash dollars. In the old days the land provided the raw products, wool, material for soap, candles, herbs to make dyes, and food products, so that the securing of raw products did not involve the expenditure of actual dollars. Today every scrap of raw material even the lowly thread and can opener, must be paid for in cash. Whereas the housewife in old days by her own handwork contributed largely to the family budget; today everything required for her husband, her children and herself calls for an outlay of actual dollars; consequently in the average home she and her children are an economic burden.

The hard work of the pioneer woman plus the excessive childbearing took the lives of many of them before they were thirty. A man sixty or seventy years ago required another wife to carry on and thus he was able to absorb another female. Today with preventive medicine and easier living conditions both men and women live to the fifth and sixth decade. Barring accidental death, one wife sees him through. If he takes more wives it is done in tandem style, which does not relieve the glut in women available for industry. The war killed and maimed a few hundred thousand potential husbands. Thus we have many more single women to be attracted by



the pay envelope of industry, hurried thither by pangs of downright hunger of self and loved ones.

In olden days the wife's expectations upon entering matrimony were not up to much. She usually had been taught her "duty" was toward her husband. If she was happy and contented so much to the good; if not, that was her hard luck and public opinion and church edict dared her to complain. Today a woman expects as much from the marital state as a man, and if the experience is disappointing she is just as quick to discard him as he her. In the interlude between husbands economic independence is a necessity for all but the rich, and once more we have a woman answering the magnetic appeal of the pay envelope that might belong to a man.

When the pioneer woman had a baby she was adding to the wealth of the family, a child to grow up and work on the farm or to carry on a business the father had sweat to nourish. The modern pregnancy is an expense from the first prenatal day until the last whiff of anesthetic dies away, and then are added tonsilleotomies, summer camps, swimming pools at fifty cents a day when most of the older generation swam delightedly in the old pond, appendectomies, college, and—in extreme cases—perhaps a year or two of marriage "until John or Mary get on their feet." Our forefathers may have taken ten or twelve children in a stride, but it is a brave father who conscientiously can face more than three or four children in modern life.

As for the mother who wants to devote her life to "home making, rearing of children, creating character and devotion in them; etc," the majority even today would prefer this, but as soon as the mother is safely home from the hospital she feels the onslaught of the infant welfare clinic, the public health nurse, behaviour clinics, scouts and baby scouts; and if these were not enough there are the raucous ravings of the psychiatrist and analyst warning her to "Cast off! Cast off! before your child develops an emotional fixation at the mother level." Thus in a very few years the woman finds her work nearly finished except for a touch here and there, and unless a couple of children with interests entirely outside of the home and a five room apartment can absorb the emotional charge that should be spread over many years we find her once more—like the pro-

verbial bad penny—at the gates of industry looking for her old job.

"After all, what are the secret ambitions of the human female? Do they differ so greatly from her forbears?" Not at all. A good husband and children will always be a biologic necessity for the normal woman; but in spirit with changing times the modern woman has been forced to change her method of availing herself of these satisfactions which, as a woman, she craves. Her pay envelope must be added to his to found and vitalize a home and pay for the children. Her handwork will not suffice. Actual cash is needed, at least until such time as we find a new way. Unquestionably under existing conditions the women are bearing an additional strain in the day's labor plus the physical labor and emotional demands of the home, but until a new way is developed the man and the woman, in the majority of cases, working together in industry must share the responsibility of the home. If our young women are willing to pay this price to have a home and children, more power to them. Surely they are deserving of our moral support in coping with conditions which they did not manufacture. Already we see boys and young men eager and willing to co-operate in the maintenance of such a home. What may seem new and different to us will be routine for the oncoming generation and thus they will find the "happiness in familiar avenues" of which Dr. Harger speaks.

"Human happiness was greater than it is today," said Dr. Harger. I challenge this statement. How can we ever know whether another generation has been happier? How can we know whether our neighbor of today is happy? Happiness varies from person to person and from group to group; it transcends time, generations, material wants and opportunities. There are some whose requirements are met by food and clothing and a little fun; supply their material comforts and they ask no more. Others there are who define happiness in terms of opportunity to serve and to create, to match wits, indulge the senses with music, art and poetry, to build enriching friendships—all of which bespeak education and opportunity for expression for female as well as male. There are a few who achieve a high level of spirituality and live in a contemplative world; these will be found in all generations and they seem to be able to live happily in spite of

economies, machines, wars, or famine. Surely, the happiness of people cannot be defined in terms of depressions or lack of depressions.

It is futile to look back and wish for the old times. And it is just so much moonshine and piffle to talk of replacing women in industry with men. Those of us who are close to the psychology of our patients know women cannot go back to homes bereft of opportunity for creative labor without inducing an unhealthy personality change. Furthermore the wealth of our country and the generosity of industry will have to leap ahead tremendously to bestow upon husbands wages and salaries that will support a wife and children faced with modern standards of living and the requirements thereof. We might be able to replace with men some of the women who earn meager salaries, but it is a prime optimist who dares to pry a woman with any spunk from a job that pays well and—*more important*—affords her an outlet for an emotional charge.

CAROLYN N. MACDONALD, M. D.,  
55 East Washington St.

#### VETERANS' SERVICE COMMITTEE

##### DINNER

May 18, 1937—6:00 P. M.—Pere Marquette Hotel

As usual the "Veterans' Service Committee" will be given on the first evening of the convention. Many of the problems relative to the care of the veterans as they affect the medical profession are better understood but not yet wholly solved.

It will be of great interest to hear the following prominent speakers:

Roy C. Heflebower, Colonel, M. C., U. S. A., Illinois Reserve District 6 Corps Area, who is an authority on "The Organization of the Medical Service of the Army in War."

Dr. Norman L. Sheehe, Department Surgeon of the American Legion will speak on "The Accomplishments of the Medical Commission."

Leonard Appelquist, Senior Vice-Commander, Department of Illinois, will speak on "The Veterans' Viewpoint."

Further details will be published in the May issue of the JOURNAL and in the program. It

is urged that all doctors attend. It is not necessary to be a veteran.

#### Veterans' Service Committee:

F. O. FREDRICKSON, M. D., *Chairman.*

JOHN M. HAYES, M. D.

J. S. NAGEL, M. D.

F. G. NORBURY, M. D.

T. B. WILLIAMSON, M. D.

W. C. BURKETT, M. D.

#### BACK NUMBER WANTED

Members of the Society are requested to return copies of January, 1937, ILLINOIS MEDICAL JOURNAL to Dr. C. J. Whalen, 6221 Kenmore Avenue, Chicago, so that requisitions for this number can be filled.

#### TREATMENT OF MENSTRUAL MIGRAINE WITH SMALL DOSES OF GONADOTROPIC EXTRACT OF PREGNANCY URINE

After experimenting with the gonadotropic factor from pregnancy urine in the treatment of menstrual headache for the preceding two years early in 1933, William M. Moffat, Santa Barbara, Calif. (*Journal A. M. A.*, Feb. 20, 1937), evolved the following routine: Beginning on the fifth to the seventh day after the onset of the menstrual flow a small dose usually ranging from 2 to 6 rat units, is given; the dose is slightly increased daily until the tenth day, then rapidly increased, reaching a maximum of from 50 to 125 rat units on the fourteenth day, after which from 25 to 50 units is given daily until the onset of the next menstrual period. His results in seventeen selected patients followed over a period of three years tend to confirm the hypothesis that a leading factor in the production of menstrual migraine is either an ovarian or an anterior pituitary dysfunction, and probably an ovarian hypofunction or pituitary hyperfunction. All were relieved although some, usually those who had suffered most severely over the longer periods, have been unable to discontinue treatment entirely. These were selected cases, all with a special type of migraine. In only four of the eleven cases studied roentgenologically was a normal sella turcica found. To explain the results, the following hypothesis is submitted. These seventeen women were all menstruating more or less regularly and therefore could not have had a severe form of pituitary deficiency. Consequently administering gonadotropic substance from pregnancy urine to them was equivalent to the combined therapy of this factor and the "synergist" from the anterior pituitary, which combination has been shown to produce maximal ovarian stimulation.

Vitamin C deficiency is regularly encountered in pulmonary tuberculosis and is most marked in all febrile and destructive forms of this disease. Hasselbach, F., *Deutsche Med. Wchnschr.*, June 5, 1936.



## ILLINOIS STATE MEDICAL SOCIETY

### PROGRAM

### EIGHTY-SEVENTH ANNUAL MEETING

PEORIA, ILLINOIS

May 18, 19, 20, 1937

#### PRESIDENT'S DINNER

The annual President's Dinner in honor of Dr. Rolland L. Green, President of the Illinois State Medical Society, will be held in the ball room of the Pere Marquette Hotel, on Wednesday Evening, May 19, at 7:00 o'clock. All living past presidents of the Society will be guests at this function, and they will not be called on for any addresses. All members and guests attending the annual meeting should arrange to attend the President's Dinner.

Tickets for the dinner will be sold at the Registration headquarters and by members of the President's Dinner Committee on Tuesday and Wednesday.

Complete information concerning the program for the Dinner will appear in the official program and announcements in the May ILLINOIS MEDICAL JOURNAL.

#### ALUMNI AND FRATERNITY LUNCHEONS

All Alumni and Fraternity luncheons to be held during the 1937 Annual Meeting, will be scheduled for Wednesday Noon, May 19.

Definite announcements will be made concerning these luncheons in the May JOURNAL.

#### THE STAG

In accordance with the well established custom in this Society, the Peoria Medical Society will act as host for the complimentary stag for all men attending the meeting, at 9:00 P. M. Tuesday, May 18.

No information concerning the entertainment to be given, has as yet been made available for publication, but will be given in detail in the official program.

#### VETERAN'S SERVICE COMMITTEE DINNER

According to the usual custom all medical veterans are urged to be present at the Dinner to be held on Tuesday Evening, May 18, 1937. Dr. F. O. Fredrickson, Chairman of the Veterans' Service Committee will officiate at the dinner, and an interesting program is being arranged. Any physician desiring to attend the

dinner is cordially invited, for it is not limited to veterans only.

Complete information concerning the program for this dinner meeting will be announced in the May ILLINOIS MEDICAL JOURNAL.

## ILLINOIS STATE MEDICAL SOCIETY

### EIGHTY-SEVENTH ANNUAL MEETING

PEORIA, ILLINOIS

May 18, 19, 20, 1937

### WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

#### OFFICERS

President, Mrs. F. P. Hammond.....Chicago  
 President-Elect, Mrs. H. B. Henkel...Springfield  
 First Vice-President, Mrs. E. J. Berkheiser..  
 .....Chicago  
 Second Vice-President, Mrs. I. L. Foulon...  
 .....East St. Louis  
 Third Vice-President, Mrs. A. H. Brumback..  
 .....Chicago  
 Treasurer, Mrs. William Raim.....Chicago  
 Corresponding Secretary, Mrs. Frank Alford..  
 .....Crystal Lake  
 Recording Secretary, Mrs. A. H. Baugher....  
 .....Chicago

#### COUNCILORS

Mrs. Imas Rice, Aurora, Ill.....1st Dist.  
 Mrs. R. E. Davies, Spring Valley, Ill...2nd Dist.  
 Mrs. Lucius Cole, River Forest, Ill....3rd Dist.  
 Mrs. E. J. Meyer, Chicago, Ill.....3rd Dist.  
 Mrs. Carl A. Hedberg, Chicago, Ill....3rd Dist.  
 Mrs. F. E. Bollaert, East Moline, Ill...4th Dist.  
 Mrs. J. E. Reisch, Springfield, Ill....5th Dist.  
 .....6th Dist.  
 Mrs. T. D. Laney, Salem, Ill.....7th Dist.  
 Mrs. E. F. Allen, Arcola, Ill.....8th Dist.  
 Mrs. E. W. Burroughs, Harrisburg, Ill.9th Dist.  
 Mrs. R. F. Stanton, E. St. Louis, Ill..10th Dist.  
 Mrs. E. R. Steen, Joliet, Ill.....11th Dist.

#### CHAIRMAN OF STANDING COMMITTEES

Organization, Mrs. H. B. Henkel....Springfield  
 Press & Publicity, Mrs. V. M. Seron.....Joliet  
 Legislation, Mrs. W. D. Chapman.....Silvis  
 Printing, Mrs. H. M. Camp.....Monmouth  
 Program, Mrs. A. B. Middleton.....Pontiac  
 Revisions, Mrs. R. K. Packard.....Chicago  
 Public Relations, Mrs. J. A. Wolfer....Chicago  
 Hygeia, Mrs. M. L. Hole.....Danville  
 Finance, Mrs. F. O. Frederickson.....Chicago

Archives, Mrs. John Soukup . . . . . Chicago  
 Hostess, Mrs. A. H. Brumbaek . . . . . Chicago  
 Credentials & Registration, Mrs. I. L. Foulon  
 . . . . . East St. Louis  
 Convention, Mrs. Milo Easton . . . . . Peoria

#### WOMAN'S AUXILIARY PROGRAM

All physicians' wives are urged and cordially invited to attend all general sessions of the Auxiliary and their luncheons, dinners, tea, and tours.

#### *Tuesday Morning, May 18, 1937*

- 8:30 Registration at Headquarters, Jefferson Hotel. All business sessions to be held in the Ball Room of the Jefferson Hotel.  
 10:00 Board Meeting.  
 11:30 Conference of County Presidents and members with the President-Elect and the following State Chairmen: Legislation, Hygeia, Public Relations and Organization.  
 12:00 Luncheon—Creve Cour Club. Mrs. Frank P. Hammond, President of the State Auxiliary, presiding.  
 Address—Mrs. Robert Fitzgerald.

#### *Tuesday Afternoon, May 18, 1937*

- 2:00 General Session for all physicians' wives, Jefferson Hotel.  
 Invocation.  
 Address of Welcome—Mrs. Milo T. Easton, Convention Chairman.  
 Response—Mrs. Harry J. Dooley.  
 4:00—6:00

Tea and Musical—Peoria Country Club.  
 Violinist—Mrs. Harry Lloyd  
 Soloist—Mrs. Gilbert Geiger  
 Accompanist—Mrs. Harry A. Durkin  
 Soloist on Piano—Master Harry A. Durkin.

#### *Wednesday, May 19, 1937*

- 8:00 Breakfast for Board Members only. Jefferson Hotel.  
 9:30 Business Session. Jefferson Hotel.

#### *Wednesday Afternoon, May 19, 1937*

- 1:00 President's Luncheon, Jefferson Hotel.  
 Guests of honor—All Past-Presidents.  
 Introduction of the incoming President, Mrs. H. B. Henkel.  
 Also of Councilors, the newly elected officers, of the Woman's Auxiliary to the Illinois State Medical Society.  
 Address.

- 3:30 Tour and trip through the Hiram Walker Distillery.

#### *Wednesday Evening, May 19, 1937*

- 6:30 President's Dinner and Dance—Ball room of the Pere Marquette Hotel.  
 Before 3:00 P. M. all visitors must be registered for the trip to the Country Club and Hiram Walker Distillery. Cars leave the Liberty Street side of the Jefferson Hotel promptly at 3:30 each day. Please register at the INFORMATION DESK either at the Jefferson or the Pere Marquette Hotels.  
 Peoria's hostesses will be found in the lobby of both hotels.

#### *Thursday Morning, May 20, 1937*

- 8:00 Board Breakfast—Guests of Mrs. F. P. Hammond, President of the Auxiliary.  
 9:30 Post Convention Board Meeting—Mrs. H. B. Henkel presiding. Jefferson Hotel.

#### SOCIAL FUNCTIONS FOR ALL LADIES

#### *Tuesday, May 18, 1937*

- 12:00 Noon Luncheon—Creve Cour Club.  
 4:00 to 6:00 Tea and Musical at the Peoria Country Club.  
 7:00 Bridge Dinner at the Jefferson Hotel.

#### *Wednesday, May 19, 1937*

- 1:00 Luncheon at the Jefferson Hotel.  
 4:00 Trip through Hiram Walker Distillery.  
 6:30 President's Dinner and Dance. Cards. Pere Marquette Hotel.

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#### SECRETARIES' CONFERENCE

Donald W. Killinger, *Chairman*. . . . . Joliet  
 John W. Long, *Vice-Chairman*. . . . . Robinson  
 D. D. Monroe, *Secretary*. . . . . Alton

#### *Tuesday Morning, May 18, 1937*

9:00—12:00

Call to Order and Opening Remarks. . . . .  
 . . . . . Donald W. Killinger, Chairman, Joliet  
 "Retrospect and Prospect". . . . .  
 . . . . . Rolland L. Green, President, Illinois State Medical Society, Peoria  
 "Correlation of Secretarial Duties in the State Medical Society". . . . .  
 . . . . . Harold M. Camp, Secretary, Illinois State Medical Society, Monmouth  
 Questions and Answers.  
 "How May the County Medical Society Aid in the Rendition of Township Relief". . . . .



..... Mr. John  
Beineman, Oak Hill, Illinois. Chairman of  
the Board of Supervisors of Peoria County  
Discussion opened by A. R. Brandenberger,  
Secretary of Vermilion County Medical Society,  
Danville.

"State Medicine"..... John R.  
Neal, Chairman, Legislative Committee,  
Illinois State Medical Society, Springfield

"Socialized Medicine"..... Robert H. Hayes,  
Secretary, Chicago Medical Society, Chicago

"What the Educational Committee Does for  
County Medical Societies"..... Miss Jean Mc-  
Arthur, Executive Secretary, Educational  
Committee, Illinois State Medical Society  
Questions and Answer Period for County So-  
ciety Secretaries.

Annual Election of Officers of Secretaries'  
Conference.

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#### PEDIATRICIANS' MEETING

Arthur H. Parmelee, *Chairman*..... Oak Park

Joseph K. Calvin, *Vice-Chairman*..... Chicago

Gerald M. Cline, *Secretary*..... Bloomington

*Tuesday Morning, May 18, 1937*

PERE MARQUETTE HOTEL,

Creve Cour Room

9:00—12:00

#### A SYMPOSIUM ON PNEUMONIA

"General Introduction, Etiology and Classifi-  
cation"..... Joseph Brennehan, Chicago

Discussion opened by Scott Wilkinson, De-  
catur.

"Symptomatology and Diagnosis".....

..... W. L. Crawford, Rockford

Discussion opened by Fred Maurer of Peoria.

"Complications, Sequelae and Prognosis"....

..... John Vonachen, Peoria

Discussion opened by Walter Whitaker,  
Quincy.

"Treatment"..... Joseph K. Calvin, Chicago

Discussion opened by King Woodward, Rock-  
ford.

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#### OBSTETRICIANS AND GYNECOLOGISTS' MEETING

Ralph A. Reis..... *Chairman*

Floyd L. Heinemeyer..... *Secretary*

"Diagnosis and Treatment of Occiput Pos-  
terior Position"..... Wm. Cooley, Peoria

Occiput posterior position occurs more frequently  
than was formerly thought. Early diagnosis is impor-

tant in order to institute proper treatment as soon as  
possible.

Discussion opened by Thomas Bell William-  
son, Mt. Vernon.

"Treatment of Non-Convulsive Toxemia"....

..... Wm. Dieckmann, Chicago

The importance of the various symptoms and signs  
of toxemia will be discussed. The treatment used for  
the ambulatory cases of toxemia and also for those  
who are hospitalized will be discussed.

Discussion opened by Wm. A. Michael, Peoria.

"Endometriosis"..... Fred O. Priest, Chicago

Endometriosis, though relatively recently brought to  
our attention, is now recognized as one of the common  
new growths. It demands the consideration of each of  
us who does surgery in the female abdomen or pelvis,  
or treats conditions dealing with its physiology.

The typical symptomatology plus the characteristic  
puckering of these growths, where palpable, aid greatly  
in making the diagnosis. The choice of treatment must  
depend upon the age of the patient and location and  
extensiveness of the growth.

Discussion opened by George W. Stephenson,  
Bloomington.

"Maternal Welfare Committee Report".....

..... Fred H. Falls, Chicago

This report will cover the relationship of the Illinois  
State Department of Public Health and the Childrens  
Bureau; the advisory function of the American Com-  
mittee on Maternal Welfare; the relationship of the  
Illinois State Medical Society through its program  
committee; the activities of the Department of Obstet-  
rics of the University of Illinois, and other Medical  
Colleges in Chicago; the organization of Refresher  
courses throughout the state; the proposed summer  
courses at the University of Illinois; the co-operative  
activities of lay organizations, such as the Federation  
of Womens Clubs, Visiting Nurses Associations, Parent  
Teachers Association and the University of Illinois Ex-  
tension Division. This discussion will be supplemented  
by an exhibit in the scientific exhibit section setting  
forth these facts graphically.

"Third Stage of Labor".....

..... Holland Williamson, Danville

The paper discusses the management, mechanism and  
characteristics of the third stage of labor in the normal  
case, in caesarean section and in premature separation  
of the placenta. The use of ergot alkaloids are dis-  
cussed in their relation to the third stage. A case of  
retained placenta is reviewed in which placenta accreta  
was considered. Gentleness is the theme throughout in  
the management of the third stage of labor.

Discussion opened by Chester C. Doherty, Chi-  
cago.

"Icterus of the Newborn".....

..... Craig D. Butler, Chicago

An attempt is made to correlate the various theories  
offered to explain the occurrence of icterus neonatorum

and icterus gravis. The incidence of icterus in three-thousand newborns observed at Cook County Hospital is reported and discussed in its relation to other factors.

Discussion opened by Carl E. Sibilsky, Peoria. "Improved Post-operative Care".....

.....W. C. Bornemeier, Chicago

Comparing post-operative management of abdominal surgery of 1910 with that of 1930 suggested to E. M. Heacock, M. D., F. A. C. S. and the author, that there might still be room for improvement. By the simple method of withholding fluids by mouth for thirty-six to seventy-two hours and giving sizable amounts of morphine, we have reduced post-operative vomiting nearly one hundred per cent., almost eliminated post-operative distention and reduced the average hospital stay from sixteen days to eleven days.

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### WOMEN PHYSICIANS ACTIVITIES

Programs of special interest have been arranged for the Visiting Women Physicians at the Illinois State Medical Convention.

*Tuesday Morning, May 18, 1937*

9:00 Breakfast at the Pere Marquette Hotel. Registration at the Pere Marquette Hotel.

10:00 The Illinois Branch of the National Medical Women's Association will meet with the Obstetrical section.

*Tuesday Evening, May 18, 1937*

6:30 Twilight drives over the Bluffs and through Grand View Drive.

7:00 Dinner at the Peoria Country Club. Address by the Guest of Honor—followed by a musical in the lounge.

Dr. Margaret Meloy of Peoria, is in charge of local arrangements for the Women Physicians special meetings, and full announcements will be made in the May JOURNAL when the complete official program will be published.

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### CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE & SURGERY

George W. Staben, *President*.....Springfield  
Frederick W. Slobe, *Vice-President*....Chicago  
Frank P. Hammond, *Secretary-Treasurer*....

.....Chicago

ANNUAL MEETING, PEORIA

*Tuesday Morning, May 18, 1937*

James H. Finch, *Program Chairman*.....

.....Champaign

Arthur H. Conley, *Co-Chairman*.....Chicago

9:00 to 12:30

"Treatment of Wounds".....

.....Darwin Kirby, Champaign

"Injuries to the Intervertebral Disc—Roentgen Study".....Harry A. Olin, Chicago

"The Economic Aspect of Abdominal Drainage".....J. B. Moore, Benton

"Malpractice in Relation to Industrial Surgery".....Mr. Edward W. Rawlins, Chicago

Arthur H. Conley, Chicago. Discussion.

"Medical Problems of the Industrial Commission".....Philip H. Kreuscher, Chicago

*Tuesday Afternoon, May 18, 1937*

2:30 to 5:00 In conjunction with surgical Section of the Illinois State Medical Society.

"Pellegrini—Stieda's Disease," .....

.....Ralph M. Carter, Green Bay, Wis.

"Operation—Neck of the Femur." Movie Demonstration.....James J. Callahan, Chicago

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### MEETINGS OF THE HOUSE OF DELEGATES

*Tuesday Afternoon, May 18, 1937*

3:00 First Meeting of the House of Delegates, called to order by the President, Rolland L. Green, for Reports of Officers, Councilors, Committees, appointment of Reference Committees, introduction of resolutions, and for the transaction of other business which may come before the House.

*Thursday Morning, May 20, 1937*

9:00 Second Meeting of the House of Delegates, called to order by the President for the Election of Officers, Councilors, Committees, Delegates and Alternates to the American Medical Association, Reports of Reference Committees, and action on same, and for the transaction of other business to come before the House.

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### GENERAL SESSIONS

#### OPENING MEETING

*Tuesday Afternoon, May 18, 1937*

1:00 Eighty-seventh Annual Meeting officially opened by the President, Rolland L. Green.

1. Invocation.

2. Address of Welcome—Mayor of Peoria.

3. Address of Welcome—President of the Peoria City Medical Society, E. A. Garrett.



4. Report of Chairman of the Committee on Arrangements, E. C. Kelly.
5. Adjournment for Oration in Medicine.

1:30 Oration in Medicine, "Abdominal Visceral Pain: A Physiological and Clinical Consideration" .....  
..Virgil E. Simpson, Louisville, Ky.

*Wednesday Morning, May 19, 1937*

11:00 Oration in Surgery, "Early Treatment of Injuries of the Face and Jaws".  
.....Virley P. Blair, St. Louis, Mo.

*Wednesday Afternoon, May 19, 1937*

1:30 President's Address, Rolland L. Green, President, Illinois State Medical Society, Peoria, Ill.

*Thursday Morning, May 20, 1937*

Induction of the President-Elect.

Immediately after the closing of the meeting of the House of Delegates, Rollo K. Packard will be inducted into the office of President of the Illinois State Medical Society by the retiring President. All members and guests are urged to attend this interesting function.

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#### SECTION PROGRAMS

##### SECTION ON MEDICINE

James G. Carr.....Chairman  
Cecil Jack .....Secretary

*Tuesday Afternoon, May 18, 1937*

"Heart Disease Complicated by Pregnancy" ..

.....Gertrude M. Engbring, B. S., M. D.,

Chicago, and Don C. Sutton, M. D., Chicago

A study of 1400 women who have been referred to the Heart Clinic from the Prenatal Clinic because of some cardiac abnormality.

The diagnosis of heart disease during pregnancy is discussed.

The course of heart disease during pregnancy, labor and the postnatal periods have been studied, often several times in the same patient.

A comparison is made of the prognosis of women who have borne children with those who have not.

The care of the cardiac patient during pregnancy and labor is discussed.

Discussion opened by James E. Fitzgerald, Chicago.

"Whole Suprarenal Gland—A Useful Therapeutic Agent" (Lantern Slides).....

.....Orville Barbour, M. D., Peoria

A report of seven years experience with the oral

administration of whole suprarenal gland in certain clinical disorders of infants and children. Several hundred cases were studied. The results disprove the prevalent impression that this glandular substance is ineffective when given by mouth. Its effects upon various disorders are described according to their anatomical origin. The results obtained depend upon the potency of the products used. Contraindications and untoward reactions are pointed out.

"Clinical Problems in Diabetes".....

.....Robert W. Keeton, M. D., Chicago

The purpose of the discussion is to consider the management of some clinical problems presented by diabetics.

1. The layman hopes for a cure for diabetes. Until he is educated he is not content to accept a plan which promises only control.

2. The primary object of diet planning is to secure a diet, adequate in all respects, adapted to the patient's needs, and easily procurable. It should not differ materially from one eaten by his associates.

3. All diabetics even though they have only mild cases should be so trained that the institution of insulin is possible at any time.

4. Many cases show polyneuritis; diarrhea, irritable bowel; urinary fecal incontinence and painful extremities. Their management is discussed.

Discussion opened by George W. Parker, Peoria.

"Metaphen Intravenously in the Treatment of Tularemia". F. L. Barthelme, M. D., Effingham  
Discussion opened by Samuel E. Munson, Springfield.

"Dangers of Rapid Diuresis in the Cardio-Renal Vascular Patient".....

.....M. Herbert Barker, M. D., Chicago

Patients with long standing severe congestive heart failure have variable degrees of reduced renal function. Modern methods of careful ionic diets, remineralization and mercurial diuretics result in a rapid diuresis in most instances. The clearing of waste products such as urea, phosphates and other acids lag behind the clearance of water. This results in their great concentration causing a severe acidosis, uremia and death. The need for caution and frequent changes of the dietetic and therapeutic control of this type of patient is to be discussed.

Discussion opened by Harry A. Durkin, Peoria.

*Wednesday Morning, May 19, 1937*

Joint Session with Sections on Surgery, and Radiology

"Surgical Treatment of Appendicitis in Children".....Edwin M. Miller, M. D., Chicago

A careful clinical study of five hundred cases of acute appendicitis at the Children's Ward of the Cook County Hospital during the past three years warrants the following conclusions as to the methods of treatment:

In all cases of acute appendicitis before the stage of

perforation, immediate appendectomy is indicated. Those cases consulting the surgeon a week or ten days after the onset of perforation at a time when a localized inflammatory mass can be felt on examination, had best be treated conservatively. It is only the exceptional case in this group that will need surgical drainage. All cases presenting evidence of spreading peritonitis without clinical manifestations of localization had best be given the benefit of appendectomy no matter what the duration of time since the perforation occurred.

#### "Difficulties in Diagnosis of Appendicitis"...

.....Darwin Kirby, M. D., Champaign

The difficulty in profiting from the mistakes of others. The role of villain which the urinary tract presents in diagnosis. Confusing picture often presented by pelvic infection. Importance of referred pain. White blood counts and differential with special reference to Shilling count as aid in difficult decisions. Importance of history, especially time element. Illustrative cases and cross section of surgical opinion from recent literature.

#### "The Radiological Appendix".....

.....George M. Landau, M. D.,

Chicago, and Robert A. Arens, M. D., Chicago

The appendix, from the radiological viewpoint, will be considered. The radiological examination is often of extreme help in the determination and accurate localization of pain points to the appendix, regardless of position, which may vary considerably, having been found deep in the pelvis, in the midline, and up to the upper right quadrant in the gall bladder area. Roentgenoscopy permits of accurate localization and association of the appendix with pain points. Terminal ileitis can also be easily differentiated. The size, shape, location and variations will be considered.

#### "Diagnosis of Appendicitis in Children"....

.....H. W. Elghammer, M. D., Chicago

Abdominal pains and gastro intestinal upsets are extremely common during childhood.

Acute appendicitis presents one of the most difficult problems, we encounter among children.

The history of onset and the sequence of symptoms are of great importance.

The approach and technic of physical examination requires special consideration.

Positive and negative findings; associated pathology and differential diagnosis.

#### "Diagnostic Difficulties in Appendicitis"....

.....LeRoy H. Sloan, M. D., Chicago

#### "Post-Operative Complications of Acute Appendicitis and Their Treatment".....

.....Ciney Rich, M. D., Decatur

The postoperative complications of acute appendicitis and their subsequent treatment, depends to a large extent upon the stage of the disease with which one is dealing. Thus complications are most rare when the operation has been performed in the first thirty-six or forty-eight hours. They are more numerous and grave

during the intermediate period extending from the second to the sixth day. Cases living to come to later operation, usually have developed immunological response and some localization of their peritoneal infection.

The commoner complications to be discussed are: peritonitis, (local and generalized), ileus, secondary abscess, chest complications, phlebitis, pyemia, fecal fistula, intestinal obstruction, adhesions, and ventral hernia.

The treatment of these complications is usually surgical, and the earlier treatment is instituted following diagnosis, the better are the patient's chances for recovery.

*Wednesday Afternoon, May 19, 1937*

Chairman's Address, "Prognosis in Cardiac

Disease"....James G. Carr, M. D., Evanston  
"Scarlet Fever and Its Complications".....

.....Eberhardt H. Quandt, M. D., Rockford

In a statistical study of 783 school children, one year after having had scarlet fever, the order of frequency of acute complications was determined as well as the presence of chronic lesions in the middle ear, heart, the central nervous system, etc. Twenty-four per cent of all cases were found to have developed one or more complications of which otitis media was the most frequent. It was of interest, for example, to find that 65 per cent of the middle ear complications occurred between the ages of 6 to 10. In this relatively severe epidemic the incidence of scarlet fever for the total school population was 5.2 per cent with the lowest incidence in the school with the highest percentage of immune children prior to the epidemic.

Discussion opened by Scott J. Wilkinson, Decatur.

"Malaria with Special Reference to Narcotism".....Italo F. Volini, M. D., Chicago, and William W. Shapiro, M. D., Chicago

This study includes one hundred fifteen malaria patients. Sixty per cent were men.

Narcotic addiction, especially to heroin, is present in thirty-three per cent. It is most frequent in young men, especially of the colored race. The presence of malaria in the colored in Chicago is strongly suggestive of narcotism.

The parasites chiefly responsible for malaria were the tertian and aestivo-autumnal; the latter is foreign to the Chicago region, is usually seen in drug addicts, and produces a malaria having a great morbidity.

A suggestion is offered to explain the rising incidence of malaria in narcotic addicts.

Discussion opened by Edward J. Wheatley, Danville.

#### "Myxedema Heart" .....

.....V. Thomas Austin, M. D., Urbana

The syndrome of "Myxedema Heart" is discussed with special reference to the infrequency of associated congestive failure. Controversy over this feature may be based on lack of uniformity of acceptance of criteria



of congestive failure as compared to manifestations of myxedema per se. A case of severe myxedema is presented in which marked enlargement of the heart with typical electrocardiographic changes returned to normal under thyroid medication. The association of paroxysmal tachycardia and auricular fibrillation with vascular collapse prior to treatment without evident coronary changes or other organic heart disease, presents a possible unusual complication of "Myxedema Heart."

Discussion opened by Frank Deneen, Bloomington.

"The Treatment of Hypogenitalism in the Male".....W. O. Thompson, M. D., Chicago, N. J. Heckel, M. D., Chicago, and P. K. Thompson, M. D., Chicago

In the course of treating a large number of boys and men for undescended testes and hypogenitalism with an anteriorpituitary-like principle, the following facts were demonstrated:

1. Descent of the testes was produced in only 20 per cent.
2. Treatment with this material produced an increase in the size of the parts involved.
3. In some boys the increase in the size of the genitalia was very marked, so that a premature puberty was induced. This is one of the most serious problems involved in the treatment.
4. The increase in size was variable, dependent upon the age.

Discussion opened by Frank A. Norris, Jacksonville.

✓ "Pulmonary Changes in Rheumatic Fever"...

.....Perry J. Melnick, M. D., Decatur

In acute rheumatic fever the lungs at autopsy have a characteristic gross appearance, often called "rheumatic pneumonitis." A histologic study of the lungs was made in ten cases of rheumatic endocarditis with only verrucous eruptions and no valvular deformities. The microscopic findings consists essentially of an intense interstitial edema and hyperemia, more intense than can be explained on the basis of passive congestion alone. While not a specific pneumonia, the lung changes in rheumatic fever may be part of the allergic picture seen in this disease.

Discussion opened by Leon Unger, Chicago.

*Thursday Morning, May 20, 1937*

Joint Session with Sections on Surgery; Eye, Ear, Nose and Throat; Public Health and Hygiene; and Radiology

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#### SYMPOSIUM ON ACUTE INFECTIOUS DISEASES

"Infections of the Upper Lip".....

.....Normal Elliott, Bloomington

This paper is to review the anatomy of the upper lip and the reason for the severity of infections of the upper lip.

Also a plea for increased interest in the profession to acquaint the laity with the dangers of any manipulation of any infection of the upper lip, no matter how slight.

Also to stress the conservative treatment of infections of the upper lip in the early stages.

"Acute Infections About the Jaws".....

.....F. W. Merrifield, Evanston

Acute infections about the jaws are common sequelae to inflammation of peridental tissues, which extends to the adjacent periosteum and soft tissues.

The chief causal factor in these conditions is death and infection of the tooth pulp, either as a result of neglected dental caries or trauma.

As a general rule, acute alveolar—dental abscess, will respond to the usual dental treatment. However, as a result of trauma, particularly from ill-advised extraction, a severe infection with involvement of the soft tissues and bone may end disastrously, if not fatally, to the patient.

Because of the serious nature of these infections it seems advisable to treat even the simplest inflammation of dental origin with respect.

To present observations on these cases will be the object of this paper.

"The Fundamentals of Serum Therapy".....

.....Winston H. Tucker, Springfield

A review is presented of the disease conditions in which serum therapy has been found to be of value. The various types of animal sera and human convalescents' sera are considered, with a discussion of time and routes of administration of each. The value of serum for prophylactic use in certain conditions is touched upon. When serum of any sort is employed, the physician must be certain that the patient has not been previously sensitized to serum protein, in order to eliminate untoward reactions. This can be determined by a simple skin test, which may be followed by desensitization when such a procedure is indicated.

Discussion opened by George L. Drennan, Jacksonville.

"Human Convalescent Serum Treatment in Surgical Infections Due to Streptococcus

Hemolyticus"...Samuel L. Goldberg, Chicago

Pooled scarlet fever convalescent serum has been used in acute surgical infections due to the hemolytic streptococcus. This is a presentation of case reports of these infections treated with convalescent serum, and a discussion of the practical and theoretical considerations governing this form of therapy.

"The Quantitative Aspects of Biologic Therapy".....

.....Paul S. Rhoads, Evanston

Unless one constantly bears in mind the quantitative nature of immunity he is apt to make mistakes in biologic therapy. Examples of such mistakes will be cited. Data collected from the literature on more than 2,000 cases of tetanus developing after administration of tetanus antitoxin will be cited. The quantitative aspects of the various preparations used in active and passive immunization against scarlet fever and diph-

theria will be discussed. Brief mention of pertussis prophylaxis and specific therapy of lobar pneumonia will be made.

**"Type-specific Antipneumococcus Serum Therapy".....W. D. Sutliff, Chicago**

The therapeutic tests with type-specific antipneumococcus serum have been conducted in a more careful and thorough manner than has been the case with any previous therapeutic serum. Data will be presented today that give an adequate description of the effect of therapy on the clinical course and the mortality of the disease in America, in England, in hospitals, and in private practice in the home. Intravenous administration of adequate amounts of potent preparations of pneumococcus antibody solutions to patients in the early days of the infection will be shown to be the secret of success. Means of avoiding the dangers inherent in intravenous administration will be described. Comparisons will be made which show that the results of the efficient administration of type-specific antipneumococcus serum are comparable to those following the efficient administration of diphtheria antitoxin. Progress is constantly being made, and it now appears likely that type-specific therapy will be used as advantageously in pneumonia due to types II, 5, 7, and 8, as it can be used in pneumonias due to type I pneumococci.

**"Human Convalescent Serum and Its Application to Acute Infectious Diseases".....**

.....Sidney O. Levinson, Elizabeth Penruddocke, and Albert M. Wolf, Chicago

Human convalescent serum has been prepared at the Serum Center and the results of its use followed for over six years. Certain principles must be maintained in the technique of preparing human convalescent serum to insure a safe and effective product.

Splendid cooperation by many physicians' reporting results on the use of serum and personal observation of many patients have been the means of establishing criteria of dosages and route of administration. Human convalescent serums have been employed extensively and effectively in the treatment of poliomyelitis, the prophylaxis and treatment of scarlet fever and in the prophylaxis of measles. Limited observations have been made of the application of human convalescent serum in other acute infectious diseases. The results have been analyzed and tabulated.

**"Roentgen Therapy in Inflammatory and Infectious Lesions".....**

.....B. C. Cushway, R. J. Maier, Chicago

This presentation includes a discussion of the theories of the biological action of x-rays in inflammation and infection; dosage correlated with the accepted theories; and a report of a series of all types of infection and inflammation treated by roentgen rays.

**"The Control of Rabies".....**

.....Maurice L. Blatt, Chicago

Spot maps will be presented showing the location by counties of positive dog heads, of dog bites and of human rabies in the state of Illinois for 1936. An outline

of the method advocated for the elimination of rabies will be presented. An outline of the treatment of dog bites will be shown on slides. A hundred feet of 16 mm. movie of a child with violent rabies will be shown.

Discussion opened by Maurice Schneider, Chicago.

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**SECTION ON SURGERY**

C. Paul White.....*Chairman*  
Sumner Koch.....*Secretary*

*Tuesday Afternoon, May 18, 1937*

**TREATMENT OF INJURIES**

**"The Immediate Treatment of Injuries of the Spinal Cord".....Loyal Davis, Chicago**

Injuries to the spinal column in which the spinal cord escapes damage present a quite different problem and permit simpler therapeutic measures to be used than those in which the cord and nerve roots are involved. Prompt recognition of the problem with rational and conservative methods of treatment can accomplish much under the latter circumstances.

The mechanism and nature of fracture dislocations of the spinal column; the relative size of the spinal cord; the vertebral canal; and the buffer role of the cerebrospinal fluid are important basic factors. The immediate clinical signs of spinal cord injury with practical and simple methods for diagnosing the level of the injury and the value of spinal manometric examinations are discussed. The importance of immediate first aid treatment and the indications for and against operative intervention are emphasized.

**"The Immediate Treatment of Compound Injuries".....Michael L. Mason, Chicago**

In the management of the open wound, every effort should be made to promote healing and functional recovery. Chemical and mechanical damage must be avoided since they retard repair and favor infection. The wound, seen within four to six hours, should be carefully cleansed with soap and water, devitalized tissues excised, deep structures repaired, and the skin defect closed by primary suture or skin graft. Following this, the part should be put at rest until healing has taken place.

**"Operative Treatment of Fractures of the Neck of the Femur; Moving Picture Demonstration".....J. J. Callahan, Oak Park**

The essayist will show an instrument by which a flange may be used to correct fractured necks of the femur in an accurate and relatively simple manner. He will also demonstrate a new incision which is practically bloodless and yet affords an excellent view of the injury to the femoral neck.

The types of fractures occurring in the femoral neck will be discussed, as well as perforations of the capsule by either the proximal or the distal fragment in such a manner as to prevent reduction of the fracture. He will also describe a definite interposition of the peri-



tum and synovia between the fragments of femoral neck fractures.

"Electrical Shock Burns and Glare Injuries of the Eyes".....Hart E. Fisher, Chicago

The subject to be given is for the purpose of dispelling the misinformation that the public has received relative to the hazards of electric current, the remote effects of electrification of persons, that being electrified by high tension currents resuscitation is futile, confusion regarding scientific burn therapy and eye conditions resulting from glare of electric flashes.

The prevention treatment has proven most successful in the author's twenty-five years experience in this field.

General Discussion.

(Title will be announced later).....

.....Ralph M. Carter, Green Bay, Wis.

"Growth Deformities Resulting from Osteomyelitis".....John A. Siegling, Chicago

Skeletal deformities in osteomyelitis due to disturbances of epiphyseal cartilage growth are more frequent than is commonly considered to be the case. Total arrest of growth from an epiphyseal cartilage may result in angular deformity of the extremity. The amount of shortening or deformity depends upon the rate of growth of the epiphyseal cartilage involved and upon the age of the child at the time of growth arrest. The destruction of epiphyseal cartilage disc may be due to direct extension of pyogenic infection into it, to interference with blood supply of adjacent bone, or occasionally to trauma of inadvisable or too extensive surgical procedures. Overgrowth of the lone bone due to the presence of a chronic low grade infection in the juxtaepiphyseal region occasionally occurs but does not commonly produce a marked length inequality or deformity. Early recognition of the presence of arrested growth and prevention of deformity are stressed. Correction of deformities and length inequalities resulting from osteomyelitis are discussed.

*Wednesday Morning, May 19, 1937*

Joint Session with Sections on Medicine,  
and Radiology

"Surgical Treatment of Appendicitis in Children".....Edwin M. Miller, Chicago

A careful clinical study of five hundred cases of acute appendicitis at the Children's Ward of the Cook County Hospital during the past three years warrants the following conclusions as to the methods of treatment:

In all cases of acute appendicitis before the stage of perforation, immediate appendectomy is indicated. Those cases consulting the surgeon a week or ten days after the onset of perforation at a time when a localized inflammatory mass can be felt on examination, had best be treated conservatively. It is only the exceptional case in this group that will need surgical drainage. All cases presenting evidence of spreading peritonitis without clinical manifestations of localization had best be given the benefit of appendectomy no

matter what the duration of time since the perforation occurred.

"Difficulties in Diagnosis of Appendicitis"...

.....Darwin Kirby, Champaign

The difficulty in profiting from the mistakes of others. The role of villain which the urinary tract presents in diagnosis. Confusing picture often presented by pelvic infection. Importance of referred pain. White blood counts and differential with special reference to Shilling county as aid in difficult decisions. Importance of history, especially time element. Illustrative cases and cross section of surgical opinion from recent literature.

"The Radiological Appendix".George M. Lan-

dau, Chicago, and Robert A. Arens, Chicago

The appendix, from the radiological viewpoint, will be considered. The radiological examination is often of extreme help in the determination and accurate localization of pain points to the appendix, regardless of position, which may vary considerably, having been found deep in the pelvis, in the midline, and up to the upper right quadrant in the gall bladder area. Roentgenoscopy permits of accurate localization and association of the appendix with pain points. Terminal ileitis can also be easily differentiated. The size, shape, location and variations will be considered.

"Diagnosis of Appendicitis in Children"....

.....H. W. Elghammer, Chicago

Abdominal pains and gastro intestinal upsets are extremely common during childhood.

Acute appendicitis presents one of the most difficult problems, we encounter among children.

The history of onset and the sequence of symptoms are of great importance.

The approach and technic of physical examination requires special consideration.

Positive and negative findings; associated pathology and differential diagnosis.

"Diagnostic Difficulties in Appendicitis".....

.....LeRoy H. Sloan, Chicago

"Post-Operative Complications of Acute Appendicitis and Treatment".....

.....Ciney Rich, Decatur

*Wednesday Afternoon, May 19, 1937*

"Bile Peritonitis With Case Report".....

.....R. E. L. Gunning, Galesburg

About forty-five cases of bile peritonitis without perforation of the gall bladder, ducts, or liver have been reported in the literature. The first case has been reported by Clairmont and Von Haberer in 1910; the most recent by L. B. Johnston in 1936. Most of the cases reported have presented a clinical picture of appendicitis and have been operated as such. Idiopathic bile peritonitis presents certain physiological changes unlike other forms of peritonitis. Permeability of the walls of the arterioles and venules due to the action of bile resulting in a diffusion of plasma from the circulation into the peritoneum is the basis for the clinical findings. E. Andrews, University of Chicago, 1936.

Accompanying this condition of excessive collection of bile fluid in the abdomen is a condition of surgical shock due to shunting of the plasma from the peripheral circulation into the peritoneum. Analysis of all cases of bile peritonitis, particularly those reported by S. H. Mentzer, San Francisco, California 1934, indicates surgical drainage as the ideal treatment for such a condition. In all cases where drainage has been established and fluid balance instituted to replace the loss of blood plasma, recovery has been effected. The tendency to deviate from the older principle of drainage for all abdominal conditions should not be adhered to in these cases of bile peritonitis. Prompt, effective drainage is indicated.

"The Correction of Deformities by the Equalization of Leg Length." Methods and Results.....Paul H. Harmon, Chicago

The conditions which lead to unequal leg length are enumerated. The mechanism underlying the result and decrease in leg length is suggested in each case.

There are three methods which can be used to equalize the lengths of legs. One, epiphyseo-diaphyseal fusion in the sound extremity can be applied only during the period of rapid pre-adolescent growth, i. e., roughly 9 to 14 years. This method must be applied in relation to the expected amount of longitudinal growth in the diseased limb as well as upon racial and family expectancy. One or more epiphyses can be closed depending upon the amount of equalization to be obtained. The other two methods: lengthening the short diseased leg by excision of a portion of the diaphysis or shortening the long well leg can be accomplished at any period but preferably should be done after adolescence so that an estimation can be made of the total amount of desired permanent alteration.

"The Surgical Pathology of Tumors of the Breast".....R. B. Malcolm, Chicago

The discussion of tumors of the breast in this paper will be based upon some 200 such tumors which have been observed and diagnosed pathologically at the Research Hospital. The prevalent type is fibro-adenoma, composing approximately 60%, the remaining 40% are carcinomata showing every variety. The major portion of the time will be consumed by the discussion of the pathological entities of carcinoma showing histological slides and the methods of spread of the disease.

"X-Ray Therapy in Cancer of the Breast"... ..James T. Case, Chicago

A brief story of the development of radiation therapy of the breast to its present refinement.

Application of the Coutard principle to radiation therapy of breast cancer.

Summary of technic and results.

Critique of reports in the literature.

"A General Consideration of the Treatment of Cancer of the Breast".....Alexander Brunshwig, Chicago

A number of years ago it appeared to be generally accepted that the radical operation was the treatment

of choice for carcinoma of the breast. In recent years great advances have been made in irradiation therapy. Its employment has been considerably extended in the treatment of various forms of cancer, including operable cancer of the breast.

A few surgeons now appear to be more conservative in the operative treatment of carcinoma of the breast, feeling presumably that adequate post-operative irradiation is capable of affording the patient as good a chance for cure as offered by the radical operation. In the essayists opinion this view is unjustified. Radical mastectomy with removal of the axillary contents, pectoral muscles and breast, en masse, should still be regarded as the best method, by far, for the treatment of operable cancer of the breast. Points of operative technique and the limitations of irradiation therapy in cancer of the breast will be discussed.

*Thursday Morning, May 20, 1937*

Joint Session with Sections on Medicine; Eye, Ear, Nose and Throat; Public Health and Hygiene; and Radiology

(For program, see Medical Section.)

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SECTION ON EYE, EAR, NOSE AND THROAT

John A. Cavanaugh.....Chairman  
Charles B. Voight.....Secretary

*Tuesday Morning, May 18, 1937*

9:30—"Stabilization of the Temporomandibular Joint".....L. W. Schultz, Chicago

Various treatments for uncomfortable, weak, dislocating, loose, clicking, grating joints have been tried and found wanting. The stabilization of such joints is no longer problematical. A simple method now stops the symptoms of an aggravating traumatic arthritis of this type.

10:00—"Retinoscopic Refraction" .....Edwin R. Lescher, Chicago

This problem of the gradual taking over of our ton-sillectomies and throat work by the general man and the danger of losing our refraction business to the optometrist, optician, and department stores, and a plea to the Eye, Ear, Nose and Throat man to put his refraction equipment and methods on a par with them. A discussion on retinoscopy without cyclopegia, practical because of the united optometric propaganda against the use of "drops."

Discussion opened by W. F. Lamkin, Champaign.

10:30—"Bronchoscopy in Bronchial Asthma" .....Albert H. Andrews, Jr., Chicago

The development of the role of bronchoscopy is a most interesting subject as it unfolds in the literature. We first find bronchoscopy used in an occasional case by brave clinicians, then used in patients who did not respond to the usual methods of therapy, and today we find descriptions of the types of bronchial asthma which will respond well to bronchoscopic therapy. This sub-



ject is intensely practical for it gives a method of effective treatment to a frequently refractive type of asthma, as well as making diagnosis more accurate and supplying the allergist with better vaccines.

Discussion opened by Leon Unger, Chicago; H. R. Watkins, Bloomington; and Paul H. Holinger, Chicago.

11:00—"Lessons Learned From Blind School Survey". Robert J. Masters, Asst. Professor, Ophthalmology, Univ. of Indiana, Indianapolis

Three years ago it was discovered that the Indiana State School for the Blind had very inadequate records of the causes of blindness of its students. A survey was therefore undertaken with the purpose of making a record, as accurate as possible, of the cause of blindness of each student. During the course of this survey several interesting discoveries were made, as follows:

1. Practically every application for admission to the school carries upon it a "cause of blindness" which is meaningless and utterly useless for the compilation of statistics.

2. Considerable difficulty is encountered in making an accurate diagnosis by examination in many cases, because of lack of dependable history, plus inability to satisfactorily examine the eye grounds.

3. A challenge to the medical profession is offered by the relatively large number of children whose blindness could have been prevented.

4. The large number of cases of inherited blindness, with the apparent high percentage of transmission of some types of inherited blindness, offers another challenge to the medical profession. Some methods of meeting this problem will be discussed.

5. There are always a number of students at the school who should not be there. The need for a larger number of more widely distributed sight conservation classes is apparent.

6. The possible advantages to be derived by a school for the blind from a trained social service worker will be discussed.

7. There is no doubt regarding the value of group studies such as this for the statistical files of the National Society for the Prevention of Blindness. Similarly each individual ophthalmologist could render invaluable service to this organization by reporting to it all of the new cases of blindness which occur in his own practice every year.

11:30—"Ill Advised Nasal Surgery".....

.....H. L. Ford, Champaign

A plea for more thorough pre-operative study.

Discussion opened by George Woodruff, Joliet.

*Tuesday Afternoon, May 18, 1937*

2:30—5:00—"Round Table Discussion"

(Ophthalmology) Treatment of senile cataract.....E. K. Findlay,

Philip Corbody, and Alva Sowers, Chicago

2:30—5:00—(Subject to be announced later)

.....Thomas Allen, Chicago

2:30—5:00—"Round Table Discussion" (Ear, Nose and Throat).....Joe Beck, Chicago

#### Group 1

Management of Cases of:

1. Acute Middle Ear and Mastoid Disease in infants and children. Geo. S. Livingston, Chicago.
2. Acute Infection of Pharynx and Larynx. Walter Stevenson, Quincy.
3. Chronic Sinus Infection in Children and Adults. J. R. Lindsey, Chicago.

Discussions.

#### Group 2

1. Acute Sinus Infection in children and adults. H. L. Ford, Champaign.
2. Reconstruction Operations about the Face for the Oto-Laryngologist. M. Reese Guttman, Chicago.
3. Carcinoma of Antrum and Naso-Pharynx. Sam Pearlman, Chicago.
4. Discussion.

6:30—Banquet.

John A. Cavanaugh, Chairman.

*Wednesday Morning, May 19, 1937*

9:00—"A Report on Two Hundred Cataract

Operations". Watson W. Gailey, Bloomington

This is an analysis of the complications encountered in two hundred cataract extractions in private practice. The four methods employed were:

1. Intracapsular technic using Kalt forceps.
2. Barraquer-employing the erisophake.
3. Smith Intracapsular method
4. Extracapsular.

No serious attempt will be made to compare the incidence of complications or the end results in this series as the great majority of them were attempts to extract the lens in its capsule with Kalt forceps.

Discussion opened by O. B. Nugent, Chicago; Samuel J. Meyer, Chicago; A. B. Middleton, Pontiac; R. Griffy, Robinson.

9:30—"Modern Conception of Therapy in the Acute Infections of the Nose and Sinuses".

.....O. E. Van Alyea, Chicago

Modern writers on treatment of acute sinusitis lean toward conservatism. Rhinology now has considerable regard for the restoration of normal physiologic function in the treatment of the acute process. During the past decade considerable research in various medical centers throughout the country and abroad has directed attention to the ciliated cells of the nasal and sinus mucosa and we know that our principal means of cleansing the nose and maintaining nasal function depends upon ciliary activity. All drugs and combinations of drugs commonly used in the nose are being

carefully studied and those which inhibit ciliary action are being eliminated.

Irrigation of the sinuses is advocated for the removal of pus and the restoration of natural pathways of drainage.

The presentation will include a lantern slide demonstration of the Anatomy of the frontal and maxillary sinuses and their intranasal connections. The technique for irrigating these cavities through their natural openings will be described.

Discussion opened by Francis L. Lederer, Chicago.

10:00—"Report on Periodic Examination of School Children" .....

.....G. Harmon Brunner, Glencoe

Discussion opened by Dwight C. Orcutt, Chicago; R. J. Conlas, Mattoon; Douglas A. Lehman, Harrisburg.

10:30—Chairman's Address .....

.....John A. Cavanaugh, Chicago  
Election of officers.

### *Wednesday Afternoon, May 19, 1937*

2:30—"Borderline Compensable Eye Conditions".....Sidney Walker, Chicago

Injury—claimed as causative factor,

Refractive errors.

Hyper. Astig. Myopia,

Diplopia,

Both paralytic and convergent squint.

Pterygium and Pinguecula,

Keratitis both superficial and deep,

Cataract in nearly all forms,

Iritis

Hyalitis

Retinal condition, most often detachment.

Optic Atrophy.

Claims of aggravation of pre-existing condition, most often found in,

Cataract,

Retinal detachment.

Valid trivial eye injuries aggravated by,

Focal infection and systemic infection, superficial lacerations and superficial foreign bodies resulting disastrously.

Safeguards and counter action.

Careful ocular examination very early in eye injury or alleged eye injury no matter how trivial.

Lack of response to local treatment should call for thorough physical examination.

Proper set up from medico-legal standpoint of any case suspected of possible legal controversy.

Present move against ambulance chasing attorneys of aid to defendants.

Discussion opened by C. B. Welton, Peoria; Harry Dale, Chicago.

3:00—"Saddle Nose" .....Samuel Salinger,

Chicago, Professor of Otolaryngology, Loyola University, School of Medicine, Attending

Otolaryngologist, Michael Reese Hospital

The text will include the treatment of saddle nose with particular reference to twelve years experience with the use of ivory implants. In 1931 I reported my first fifty cases. Since that time I have used ivory in over sixty additional cases with about 85% success. The paper will include the proper selection of cases, the preparation of the implants and the technique of their insertion. Will also discuss the type of case in which auricular cartilage is advisable and demonstrate the details of this operation.

Discussion opened by Harry Pollock, Chicago; Walter Stevenson, Quincy; O. E. Fink, Danville.

3:30—"Allergy of the Upper Respiratory

Tract and Its Relation to Other Manifestations".....French K. Hansel, M. D.,

M. S., St. Louis, Mo. Assistant Professor of Otolaryngology, Washington Uni-

versity Medical School, Barnes Hospital,

St. Louis Children's Hospital, Oscar

Johnson Institute and McMillan Hospital

Allergy of the nose and paranasal sinuses will be briefly discussed from the standpoint of diagnosis and treatment. Then the other manifestations, such as asthma, allergic bronchitis, skin allergy, gastrointestinal allergy and allergic headache will be considered in relation to the nasal symptoms.

4:15—"Cellophane in Ophthalmology".....

.....Ralph H. Woods, LaSalle

Standing hospital orders in eye injuries

1. Mine cases.

2. Factory, Ry. and top men.

Conjunctival burns

Cement, lye acid, lime.

Sewing in cellophane to prevent adhesions.

Neisserian infections

Cellophane for protection of well eye.

Vernal catarrh—Folliculitis of Allergic origin.

Cellophane protestant to eyes.

Cellophane for Submucous and other intranasal dressings.

4:30—"Malignancies" .....

.....Thomas Galloway, Chicago

The treatment of cancer of the larynx with special regard to irradiation and surgery.

5:00—"Report of Intraocular Tumors".....

.....M. L. Ostrom, Rock Island

Title—Three interesting tumors of Uveal Tract

1. Malignant melanoma of iris—Spindle cell appearing 3 years after iridencleisis for glaucoma—Adult white female.

2. Malignant melanoma of choroid—White adult male.

3. Malignant melanoma of choroid mixed cell type II in adult negro male—discovered following enucleation and section of eye.

Discussion of uveal tumors including differential diagnosis.



Discussion of transillumination of globe.  
 Discussion of therapy.  
 Case histories.  
 Slides and lantern demonstration.

Discussion opened by M. P. Palmer, Oak Park.

*Thursday Morning, May 20, 1937*

Joint Session with Sections on Medicine; Surgery; Public Health and Hygiene; and Radiology

(See Medical Section, for program.)

#### SECTION ON PUBLIC HEALTH AND HYGIENE

Archibald Hoyne .....Chairman  
 Winston H. Tucker.....Secretary

*Tuesday Afternoon, May 18, 1937*

"Control of Smallpox in an Unvaccinated School Population".....Frank S.

Needham, Commissioner of Health, Oak Park

This paper is a resume of an outbreak of smallpox that developed in a community of 70,000 people, with a school population of about 13,000 school children, very inadequately vaccinated.

Smallpox had been prevalent in the surrounding towns for several months, contact exposures had been handled apparently successfully, but, eventually, the disease developed in the high school.

Vigorous efforts were put forth, and the outbreak was practically controlled in two weeks.

Discussion opened by I. D. Rawlings, Chicago, Board of Health.

"Serodiagnostic Tests for Syphilis".....

.....H. J. Shaughnessy, State Health Department, Springfield

A discussion of what recent studies of the serology of syphilis means to the health officer and physician. The principal causes of difficulty in the interpretation of laboratory findings are reviewed. Suggested procedures for the standardization of laboratory tests for syphilis are outlined.

Discussion opened by John L. White, Chicago, Board of Health.

"Whooping Cough Diagnosis and Prevention"

.....L. Sauer, Evanston

Whooping cough is most contagious early. Properly exposed cough plates show more colonies of Bordet-Gengou bacilli before the whoop is well established. After that, few if any, are recovered; negative plates do not exclude pertussis. Lymphocytosis gains in diagnostic importance when cough plates are negative. History of exposure in a non-immune child with a suspicious cough has diagnostic value; especially when the disease is prevalent.

The best age for vaccination with potent B. pertussis vaccine is between the seventh and twelfth month of life. (Total dosage, 8 cc. before three years; 10 cc. after three years). Most children so injected acquire immunity, if sufficient time intervenes between injection and exposure. Failures are less frequent since the technic of its commercial preparation has been improved and precautions in vaccine preservation and administration are more fully appreciated.

Discussion opened by Orville E. Barber, Peoria.

"Poliomyelitis"...Archibald L. Hoyne, Chicago

A review of 139 cases cared for in the Municipal Contagious Disease Hospital in Chicago. Discussion concerns the modern conception of this disease, the difficulties encountered in making an early diagnosis, and importance of proper treatment. Isolation and absolute rest are essential during the acute stage. Efficiency of serum treatment is still in doubt. After care is an orthopedic problem.

Discussion opened by John J. McShane, State Health Department, Springfield.

"Present Problems in Preventive Medicine"...

.....E. A. Thacker,

Health Service, University of Illinois, Urbana

The chronic insidious group of diseases is discussed from a public health viewpoint. The importance of regular physical and laboratory examination and the dangers from self-medication and quackery are stressed.

The medical profession must take the initiative. A program is submitted for the solution of these public health problems. It includes education through radio, newspapers, family physicians, civic organizations, theatres, reputable pharmaceutical firms and insurance companies. The extermination of cults, quacks and "patent medicines" is also a function of the program. By having the support of the people, undesirable forms of socialized medicine can never materialize.

Discussion opened by L. M. T. Stillwell, Health Officer of Urbana.

*Wednesday Afternoon, May 19, 1937*

"Industrial Hygiene—Its Historical Development and the Modern Campaign".....

.....M. H. Kronenberg, Chicago

Health problems in industry are increasing in extent and complexity. Most of them appear as a result of the rapid development and growth of air contaminating industrial processes.

The most important improvements and achievements in this field were due to 1. Legislative acts, 2. Medical inspection of industrial undertakings, 3. Compulsory reporting of industrial diseases and 4. Compensation of the diseased and disabled workers.

The continued success in Industrial Hygiene is only possible through the cooperative efforts of the physician, engineer, statesman and educator.

Discussion opened by George L. Apfelbach, Chicago.

"Diphtheria Prevention—A Municipal Problem".....N. C. Bullock,

Commissioner of Health, Rockford

Diphtheria prevention in Illinois is a problem of the

individual city. Some cities in the State have accomplished much in this important public health problem while others have done little or nothing.

The fundamental plans on diphtheria prevention in three cities of the State of Illinois are discussed in brief to represent the three different successful methods of attack. Chicago representing mass immunization under the direction of the Board of Health, Evanston on equal distribution of individual immunization by the family physician and mass immunization, and Rockford representing an example of what may be accomplished in individual immunization done entirely by the family physician in his private office.

Discussion opened by Sumner M. Miller, Health Commissioner of Peoria.

"Typhoid Carrier Control in Illinois".....

.....G. Howard

Gowen, State Health Department, Springfield

With improvement of water supply, sewage disposal, and more meticulous care of milk, the discovery and control of the typhoid carrier assumes increasing importance.

It is the purpose of this paper to present the salient features in such control, and the coincident effect on typhoid fever morbidity.

Discussion opened by Roland R. Cross, Dahlgren.

"Modern Problems in the Control of Streptococcal Diseases"....John Hays Bailey, Chicago

Isolation and quarantine have failed to control the mortality and morbidity from streptococcal diseases. A short quarantine period may increase the morbidity. The present immunization procedure against scarlet fever does not decrease, apparently, the morbidity from streptococcal infection, although it may lower the scarlet fever rate. The carrier, whether a convalescent or a normal healthy one, must be considered in any control program.

Discussion opened by Arlington Ailes, LaSalle.

"Problems of a Health Officer in a Town of 40,000 People".....H. O. Collins, Quincy

A discussion will be presented of the Quincy Public Health District erected by referendum at a general election in 1920 under the Statutes of the State of Illinois. The advantages of operating a Department of Health under this system will be pointed out. An outline will be presented on the procedure to be followed by those communities interested in establishing a Public Health District.

Discussion opened by Warren F. Pearce, Quincy.

*Thursday Morning, May 20, 1937*

Joint Session with Sections of Medicine; Surgery; Eye, Ear, Nose and Throat; and Radiology

(See Medical Section for program.)

## SECTION ON RADIOLOGY

Roswell T. Pettit.....Chairman

Ralph G. Willy.....Secretary

*Tuesday Afternoon, May 18, 1937*

2:30—"Experience with the 'periodicity' method of Roentgentherapy in the Treatment of Nasopharyngeal Carcinoma" .....

.....Alexander Brunschwig and David Tschetter, University of Chicago

The immediate results in a limited series of cases will be presented.

Discussion opened by Robert F. McNattin, Cook County Hospital.

3:00—"Radium Therapy of Cancer of Oral Cavity"....H. E. Davis, Cook County Hospital

Interstitial irradiation by means of either radium or radon, is the method of choice in radium therapy of carcinoma of the lip, tongue, floor of mouth, tonsil and buccal mucosa. Lesions of the palate and alveolar ridge mucosa require contact applications of radium with specially constructed molds. Protracted irradiation with small amounts of radium has produced more complete destruction of the tumor and less destruction of normal tissue than intensive irradiation over a short period of time.

Colored lantern slides will be shown.

Discussion opened by E. G. C. Williams, Danville.

3:30—"Irradiation Therapy in Epithelioma of the Lip"....Harry Wm. Ackemaun, Rockford  
A report on a series of 60 cases.

Discussion opened by Peter A. Nelson, Chicago.

4:00—"Some Physical Aspects of Radiation Therapy" .....

....Robert Landauer, Ph. D., Highland Park

The factors involved in obtaining desirable quantity and quality of radiation at a given point in the body are enumerated and discussed in an attempt to enable the radiologist to obtain the greatest efficiency from the apparatus at his command.

Discussion opened by Roy Kegerreis, Chicago.

*Wednesday Morning, May 19, 1937*

Joint Session with Sections on Medicine and Surgery

(See Medical Section for program.)

*Wednesday Afternoon, May 19, 1937*

2:30—"Silicosis".....Roswell T. Pettit, Ottawa, Chairman Section on Radiology

Character of tuberculous densities can be identified on the Roentgen films as a productive or exudative, having important bearings on diagnosis and prognosis. Similar differentiation based upon character of densities



can be made in pneumoconiosis separating silicosis sharply from anthracosis.

Discussion opened by Paul Dick, Chicago.

3:00—"The Diagnosis of Bronchogenic Carcinoma" ..... 1. Roentgen Aspects, A. Hartung and T. J. Wachowski, University of Illinois. 2. Bronchoscopic Aspects, Paul Holinger, University of Illinois

The increasing recognition of bronchogenic carcinoma may be accounted for in large part by the aid of roentgenology and bronchoscopy have furnished. In very early cases without definite physical or roentgen findings, bronchoscopic inspection is indispensable. Most cases come under observation when pathological changes have progressed to where they may be definitely demonstrated roentgenologically as to site, extent and concomitant secondary pathology. Bronchoscopy is necessary to establish its identity histologically. Findings observed in verified cases will be analyzed with a view towards evaluating their diagnostic significance.

Discussion opened by Willard Van Hazel, Chicago; F. Flinn, Decatur.

4:00—"Some Roentgen Considerations of the Childhood Type of Tuberculosis" ..... Earl E. Barth, Northwestern University

A roentgen study of the chest is indispensable in the examination of a child, suspected of having tuberculosis. Serial films will usually yield more definite information than a single or stereoscopic film. Two types of lesions should be looked for, the parenchymal and the tracheo bronchial. Parenchymal lesions may occur in any part of the lung and may be circumscribed or have a diffuse pneumonic appearance. Involvement of tracheobronchial lymph glands may be seen in masses which distort or protrude beyond the normal hilum.

Discussion opened by Edwin Rypins, Bloomington.

4:30—Business meeting.

*Thursday Morning, May 20, 1937*

Joint Session with Sections on Medicine; Surgery; Eye, Ear, Nose and Throat; and Public Health and Hygiene

(See Medical Section for program.)

*Thursday Afternoon, May 20, 1937*

2:30—"Value and Limitation of Encephalography" ..... Abraham Levinson, Chicago

Encephalography is indicated in children who are believed to have organic cerebral lesions, such as birth trauma, cerebral agnesia, chronic encephalitis and some cases of epilepsy. The procedure may furnish not only diagnostic information but prognostic and therapeutic aid. The paper will discuss the technique, untoward symptoms and interpretation of the x-ray film.

Discussion opened by Fred Decker, Peoria.

3:00—"Ureteral Obstructions" .....

.....E. R. Crowder, Evanston

A discussion of some phases of the obstruction of the ureter as demonstrated with the intravenous urogram.

Discussion opened by Henry Grote, Bloomington.

3:30—"Radiographic Visualization of Some Unusual Sinus Tracts" Julius Brams, Chicago

A brief general discussion of the various indications for fistulography, the use of various opaques, the value of radiological exploration of the fistulous tracts, and a report of some unusual cases.

Discussion opened by Perry Goodwin, Peoria.

4:00—"Distortion in X-Ray Films" .....

.....Edmund Halley, Decatur

An x-ray film, being a complex silhouette record, is subject to many apparent inaccuracies in the representation of normal or pathologic anatomy. Awareness of the technical factors responsible for such distortion aids more accurate mental reconstruction of the part being examined. The subject falls into three classes; distortion, resulting from varied relation between energy source, object, and recording media; that due to different types of energy source (focal spot); and distortion inherent in recording media.

Discussion opened by D. P. Weins, Peoria.

## SCIENTIFIC EXHIBITS

Pere Marquette Hotel

J. S. Templeton, *Chairman* ..... Pinckneyville  
N. S. Davis, III, *Secretary* ..... Chicago

"Plethysmographic Studies in Peripheral Vascular Diseases." Carl A. Johnson, Chicago, Northwestern University Medical School and St. Luke's Hospital.

"Colorimetric Determination of Serum Magnesium." William S. Hoffman, Chicago, Chicago Medical School.

"Human Convalescent Serum in Scarlet Fever, Measles and Poliomyelitis." S. O. Levinson, E. Penraddocke, A. M. Wolf, of Samuel Deutsch Serum Center, Michael Reese Hospital, Chicago.

"Relation Between Oral and Gastric Bacterial Flora." Robert W. Keeton, Lloyd Arnold and Marion Hood of the University of Illinois College of Medicine, Chicago.

"Hemorrhage." C. L. Birch and L. R. Limarzi of the University of Illinois College of Medicine, Chicago.

"Experimental Endocarditis Due to Pressor Reactions." A. J. Nedzel, Chicago.

"Clinical and Pathological Exhibit: Cardiac Lesions and a Case of Multiple Myelomata." A. E. Mahle and E. L. Benjamin of Northwestern University Medical School and Evanston Hospital.

"The Lesions of Lobar Pneumonia: A Clinical and Experimental Study." B. H. Robertson, W. D. Sutliff and John P. Fox of the University of Chicago.

"The Thyrotropic Hormone of the Anterior Pituitary Gland." Paul Starr and R. W. Rawson, Northwestern University School of Medicine, Chicago.

"A New Apparatus for the Registering of Heart Sounds." E. W. Hollingsworth, A. Sorenson, A. Van der Driessche, Chicago.

"The Chemistry and Pathology of Pneumoconiosis." Henry C. Sweany, Municipal Tuberculosis Sanitarium of Chicago.

"Public Health Aspects of the Cardiovascular-Renal Diseases." Louis I. Dublin, Metropolitan Life Insurance Company.

"What the Public Is Thinking About Health." American Medical Association. T. D. Hull.

"Research Studies in Morbidity, Mortality and Public Health Organization." Department of Public Health, State of Illinois; Henry Horner, Governor; Frank J. Jirka, M. D., Director.

"The Illinois Educational Program in Maternal and Child Hygiene." Department of Public Health, State of Illinois; Henry Horner, Governor; Harold H. Hill, Field Consultant in Maternal and Child Hygiene.

"The Tense Patient in General Medical Practice." Edmund Jacobson, Laboratory of Clinical Physiology, University of Chicago, Chicago.

"The Treatment of Arthritis: Demonstration of the Method of Application of Mecholyt by Common Ion Transfer with Plethysmographic Changes During Such Treatment. Demonstration of the Application of Electro-Pyrexia." D. Markson, D. Boyd, S. L. Osborne, J. R. Merriam, Northwestern University Medical School, Chicago.

"Histology of Irradiated Tumors." P. S. Melnick and A. Bachem, Decatur.

"Cancer of the Tonsil and Larynx." Max Cutler, Michael Reese Hospital, Chicago.

"Spondylolisthesis." F. A. Chandler and J. R. Norcross, Northwestern University Medical School, Chicago.

"Renal Stone." Frederick Lieberthal, Northwestern University Medical School, Chicago.

"The Use of Perirenal Air Injections in the Diagnosis of Certain Adrenal Diseases." C. H. Drenckhan and C. Gianturco, Carle Hospital Clinic, Urbana.

"Employee Health Conservation in Industry." Hart E. Fisher, Chicago Rapid Transit Company Medical Department, and Public Service Company of Northern Illinois.

"Fracture Exhibit." W. J. Potts, Oak Park, Chairman.

"Tonsillectomy." Paul A. Campbell, Chicago, Color moving pictures.

#### EXHIBITORS AT THE 1937 ANNUAL MEETING

Arlington Chemical Company, Yonkers, New York.

A. S. Aloe Company, St. Louis, Missouri.

Bard-Parker Company, Inc., Danbury, Connecticut.

The Borden Company, New York, N. Y.

Chappel Bros., Inc., Rockford, Illinois.

C. B. Fleet Company, Lynchburg, Virginia.

Gerber Products Company, Fremont, Michigan.

General Electric X-Ray Corporation, Chicago, Ill.

H. J. Heinz Company, Pittsburgh, Pa.

The G. F. Harvey Company, Saratoga Springs, N. Y.

Horlick's Malted Milk Corporation, Racine, Wis.

Kellogg Company, Battle Creek, Michigan.

Lepel High Frequency Labs. Inc., New York, N. Y.

Lederle Laboratories, New York, N. Y.

Lea & Febiger, Philadelphia, Pennsylvania.

Libby, McNeill & Libby, Chicago, Illinois.

J. B. Lippincott Company, Philadelphia, Pennsylvania.

F. Mattern Manufacturing Company, Chicago, Ill.

The C. V. Mosby Company, St. Louis, Missouri.

The Medical Protective Company, Wheaton, Illinois.

Middlewest Instrument Company, Chicago, Illinois.

Mellins Food Company, Boston, Massachusetts.

V. Mueller & Company, Chicago, Illinois.

M. & R. Dietetic Laboratories, Inc., Columbus, Ohio.

Mead Johnson & Company, Evansville, Indiana.

Philip Morris & Co., Ltd., Inc., New York, N. Y.

Pet Milk Sales Corporation, St. Louis, Missouri.

Petrolagar Laboratories, Inc., Chicago, Illinois.

Sutliff & Case Co., Inc., Peoria, Illinois.

W. B. Saunders Company, Philadelphia, Pa.

Universal Products Corporation, Pottstown, Pa.

#### RULES GOVERNING PRESENTATION OF PAPERS

"All papers read by members shall be limited to twenty minutes and remarks in discussion to five minutes, floor privilege being allowed only once for the discussion of any one subject.

"All papers read before the Society or any of its Sections shall become the property of the Society. Each paper shall be deposited with the Secretary of the Section when read and the presentation of a paper to the Illinois State Medical Society shall be considered tantamount to the assurance on the part of the writer that such paper has not already appeared and will not appear in medical print before it has been published in the Illinois Medical Journal.

"A paper not heard in its scheduled turn shall be held subject to the call of the Chairman of the Section at the end of the regular session if time permits, or as an alternative at the end of the program.

"All subjects shall be confined strictly to the subject in hand.

"No paper shall appear in the printed transactions of the meeting unless read in full or in abstract."

(From the By-Laws of Illinois State Medical Society)

#### NOTES ON EXHIBITS

The W. B. Saunders Company, at booth number 15, will exhibit a complete line of their publications. Of particular interest will be many new books and new editions, including a brand new, remade edition of Warbasse-Smyth's three volume work on Surgical Treatment. This work contains 3,000 pages and 2,500 illustrations, and covers the entire management and treatment of all surgical cases—medical as well as non-medical treatment.

Other important works in the surgical field are Bickham's seven volume, "Operative Technic," Christopher's "Minor Surgery," and the new Mayo Clinic Volume.

In the field of general medicine and the specialties,



important new works include, "The Medical Clinics of North America," Levien's "Clinical Heart Disease," Wolf's "Clinical Endocrinology," Berens' "Eye Diseases," Curtis' three volume "Obstetrics and Gynecology," the new edition of Griffith and Mitchell's "Pediatrics," the new Sollmann's "Pharmacology," a new work on "Diseases of the Larynx," by Chevalier Jackson, and Tuft's new book on "Clinical Allergy."

Gerber's in booth number 16, cordially invites you to stop and see their two new products, Strained Apricot-Apple Sauce and Strained Liver Soup with Vegetables.

Gerber's have two types of literature, some for distribution to patients, and some for professional use only. Samples of the foods and the literature will be sent to registrants at the booth.

The proportion of maltose and dextrins in Mellin's Food, the protein and mineral content and the favorable effect of Mellin's Food on the digestibility of milk are distinctions that commend Mellin's Food as a modifier of milk for the feeding of infants and for the preparation of nourishment for adults requiring a restricted diet. Physicians are invited to call at our booth—number 2, to discuss their feeding problems.

A feature of the Mead Johnson exhibit, in booth number 17, will be a display of the Percomorph group of products; namely, Mead's Oleum Percomorphum, 50 per cent in liquid and in capsule form, and Mead's Cod Liver Oil Fortified with Percomorph Liver Oil.

The Medical Protective Company is represented at booth number 24 where you are invited to call. Medical Protective Service is an institution of the medical profession whose legal liability problems we have concentrated upon for 38 years.

Bring your professional liability questions and problems to booth 24. Our representative is at your service to present our protection plan, to explain the peculiar relation of the doctor to the law which governs your practice, or to discuss any particular phase of Professional Liability in which you are especially interested.

A number of new books will be displayed by the J. B. Lippincott Company (Booth number 25) including Emerson's "A Textbook of Medicine"; Pfaundler and Schlossmann's "Diseases of Children"; McBride's "Disability Evaluation"; Hermann's "Passive Vascular Exercises"; Peham and Amreich's "Operative Gynecology"; and Kirschner's "Operative Surgery."

We will also display an entirely new work, just issued, on the "Thyroid and Its Diseases," by Means, showing the results obtained at the Thyroid Clinic of the Massachusetts General Hospital.

V. Mueller & Company in booth number 1, will have on display many new items, and they cordially invite you to spend as much time as you wish at their exhibit, inspecting the many recent developments in surgical instruments.

The Cold Cautery Scalpel should be of special interest, also the Shahan Ophthalmic light and Furniss intestinal Anastomosis Clamp. An extensive line of instruments for fractures and bone surgery will also be shown.

Mueller's exhibits are always interesting and instructive.

A. S. Aloe Company, in booth number 14, will display a general line of surgical instruments and equipment for the physician and hospital.

The new Aloe Short Wave Diatherm, the Elliott Treatment Regulator, the deBakey Blood Transfusion Instrument and the newly created Steeline furniture for the treatment room, will be featured.

Mr. V. Drennan, Aloe representative in this territory, will be in attendance to serve in any way possible.

In booth number 26, the G. F. Harvey Company will display some of our special preparations which are known as "Ethical Products for the Medical Profession."

Physicians are cordially invited to visit the new convention display at booth number 12, where Petrolagar Laboratories, Inc. will be represented by Mr. R. A. Beeson.

Petrolagar is an emulsion of pure mineral oil (65 per cent by volume) and agar-agar, accepted by the Council on Pharmacy and Chemistry of the American Medical Association for the specialized treatment of constipation. Scientific drawings and literature on the subject of constipation will be available in addition to samples of the five types of Petrolagar.

A warm welcome awaits all physicians at the Borden booth, number 18. Especially trained representatives will gladly provide information on Borden products, notably DRYCO, Special DRYCO, KLIM, BETA LACTOSE, Merrell-Soule Prescription Products and Borden's Irradiated Evaporated Milk.

Be sure to stop at booth number 22 when you are visiting the technical exhibits and get a few very interesting and educational facts on the New Jones MOTOR BASAL unit.

It is Council accepted, guaranteed for life, contains no water, and embodies many exclusive features which will interest you.

At space number 27, in charge of L. E. Drury, Lea & Febiger will exhibit a number of important new works including:

- Atkinson on the Ocular Fundus.
- Brahdy & Kahn on Trauma and Disease.
- Bond's Introduction to Medical Science.
- Levinson & MacFate's Clinical Laboratory Diagnosis.
- Werner's Endocrinology.
- Wesson & Ruggles' Urological Roentgenology.
- Davis' Neurological Surgery.

New editions of the following standard works will also be shown:

- Bridges' Dietetics.
- Cabot's Urology.
- Cushny's Pharmacology.
- Gifford's Ocular Therapeutics.
- Kuntz on Neuro-Anatomy.
- Rhinehart's Roentgenographic Technique.
- Starling's Physiology.
- Gray's Anatomy.
- Holmes & Ruggles' Roentgen Interpretation and others.

You are cordially invited to visit the Horlick's Malted Milk Corporation Exhibit in booth number 3. Your attention is drawn to the special advantages of Horlick's Malted Milk as a nutritious, easily digested food-drink, often acceptable when no other food can be tolerated. Its special value will be pointed out:

1. For infant feeding.
2. For growing children.
3. For nursing mothers.
4. For the undernourished.
5. For the sick, especially in fever and ulcer diets.
6. For the convalescent.
7. In sleeplessness.

Libby's Baby Foods are prepared by a new and different method of homogenization, which breaks up the food cells and liberates nutriment for ready and easy digestion: roughage is reduced to tiny particles so that bulk is present for normal elimination without dangers of irritation. Doctors are invited to inspect these products at Libby's booth number 4. Pineapple Juice and Tomato Juice are being served.

Philip Morris & Co. Ltd. Inc., will demonstrate at booth number 23, the method by which it was found that Philip Morris cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than ordinary cigarettes in which glycerine is employed.

An actual working model of a milk condensing plant in miniature—every part constructed to scale—will be exhibited by Pet Milk Company in booths five and six.

It will show the method by which the milk is processed from the time it is received from the farmer until it is sterilized in the can ready for use.

The C. V. Mosby Company will exhibit its complete line of medical publications. Among the new editions to be shown for the first time will be the following:

- Horsley-Bigger—"Operative Surgery."
- Meakins—"The Practice of Medicine."
- Mansfield—"Materia Medica."
- Sadler—"Theory and Practice of Psychiatry."
- Titus—"The Management of Obstetric Difficulties."
- Hirschman—"Synopsis of Ano-Rectal Diseases."
- Shands—"Handbook of Orthopedic Surgery."

Physicians attending the Illinois Medical Convention are cordially invited to inspect these, and other Mosby publications at booth number 28.

The Lederle Laboratories, Incorporated, displays in booth number 21, a number of outstanding biological and pharmaceutical products—Solution Liver Extract in 1 cc. vials for intramuscular use; Pollen Antigens, for the treatment of hay fever, in individual dose packages, and also in the more economical bulk packages; Globulin Modified Antitoxins, low in volume and with serum protein content greatly decreased; Vitamin B Complex and other important vitamin products. Literature, descriptive of these and all other Lederle products, will be available at the booth.

The exhibit of Sutliff & Case Company, Inc., to be found in booth number 11, will again feature their product "A VITAM-UNG."

Many clinical reports have been received from all parts of the country showing the satisfactory results obtained from the use of this preparation in the treat-

ment of burns, chronic ulcers, and infected wounds.

"A-VITAM-UNG" represents a successful blending of the primary form of Vitamin A in plant material into a sterile ointment base, and it contains approximately 2,000 U. S. P. XI units per gram of Vitamin A activity, which is thought to be the optimum concentration for stimulating granulation of denuded and abraded body tissue. Literature and demonstrations relative to the use of this preparation will be made a part of the display.

The Arlington Chemical Company, Yonkers, N. Y., in booth number 29, will feature their protein and pollen extracts for diagnosis and desensitization of allergic conditions, especially the one dollar diagnostic pollen outfits and the \$25.00 and \$35.00 protein outfits. Their experts at their booth will be pleased to discuss any allergic problems.

H. J. Heinz Company, makers of the 57 Varieties, invites you to visit their new exhibit at booth number 7, featuring strained foods, breakfast cereals and olive oil.

Stop for a cold drink of Heinz Tomato Juice and register for the third edition of the Nutritional Chart. The two previous editions were so enthusiastically received that it was thought advisable to make frequent revisions in order to keep abreast with the rapid advances in the field of nutrition.

Lepel Laboratories will exhibit two Ultra-Short Wave Machines, a portable and an office model, and a Lepel Quartz mercury lamp, at their booth, number 8.

The dominant feature of the Lepel Ultra-Short Wave machine is that it uses fixed spark gaps, instead of vacuum tubes. Each machine is actually five machines in one, embodying as they do, in addition to the short wave therapy, circuits for desiccation, coagulation, cutting and the operation of both body and orificial quartz mercury ultra-violet lamps.

The Bard-Parker Company will demonstrate at booth number 30 the outstanding features of their Rib-Back blade incorporating new standards of cutting efficiency and economy.

Also will be shown a complete line of stainless steel scissors with renewable edges which eliminate resharp-ening, a selection of quality forceps with the Lahey lock and an interesting demonstration of Rustproof sterilization for surgical instruments with B-P Formaldehyde Germicide.

Fifty years of meritorious results are back of the name Phospho-Soda (Fleet). The elimination action of Phospho-Soda (Fleet) has been recognized and appreciated by generations of physicians. ACCEPT NO SUBSTITUTE. Samples will be supplied upon request at booth number 10.

At the Universal Products Corporation table you will find displayed SURGEONS' X-L-LYTE, a compact and serviceable diagnostic set, and not expensive. This set contains ear speculum, tonsil pillar retractor, tongue depressor, magnifying lens, and nasal speculum, with direct illumination for all.

Nickel silver curette, probe, ear spoon and applicator are included in the set.

The entire set is contained in a neat and serviceable leather case which is equipped with a hookless fastener.



The new, lightweight, low-priced G-E Electrocardiograph will be exhibited in the General Electric X-ray Corporation's booth number 31.

This fine instrument will be of interest to every physician as will, also, the recently introduced Model "F" Ultraviolet Lamp—a better lamp costing less; the world-famous Inductotherm, and portable, shockproof X-ray equipment.

## ILLINOIS STATE MEDICAL SOCIETY

### EIGHTY-SEVENTH ANNUAL MEETING

PEORIA, ILLINOIS

May 18, 19, 20, 1937

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## QUANTITATIVE STUDY OF FRIEDMAN TEST FOR PREGNANCY

G. Lombard Kelly and E. Bryant Woods, Augusta, Ga. (*Journal A. M. A.*, Feb. 20, 1937), state that the presence of one or more ruptured follicles in either ovary or both ovaries in this test constitutes a positive reaction. The presence of several unruptured hemorrhagic follicles in both ovaries (usually two or more in each ovary) is also a positive reaction. Unruptured hemorrhagic follicles are red; black follicles of all sizes have no significance and must be disregarded. Corpora lutea visible to the naked eye do not develop within forty-eight hours nor can they be seen with the low power binocular microscope. Only high magnification of histologic sections could show them. In many cases the low power binocular microscope is necessary in order to reach a correct decision and will prevent repetition of the test in such cases. For recognizing ruptured follicles its use should be routine. The common modification of the Friedman test is satisfactory, though the original Friedman technic gives better quantitative results. One 10 cc. injection of urine with examination in thirty-six hours is not nearly so successful as the double injection, and better results would be obtained with two injections and examination in forty-eight hours. Rabbits weighing more than 3 pounds will give better results than those weighing less, and 3 pounds is a safe minimum. It is not necessary to acidify the urine, though it is better to do so, as the hormone present is more active in an acid medium. Urines do not kill test animals because of alkalinity. It is safer not to use urines with a specific gravity of less than 1.008. If it is necessary to use such urines, the quantity injected in each instance should be increased at least 50 per cent.

## HOW MANY NEED HELP?

Within a small margin of error, about 50 per cent of the population goes through the year without any illness. Fifty per cent of the illnesses of the other half are not disabling. One-half of the remainder, or about 12½ per cent, are of a minor character, such as the common cold, and involve a disability of less than a week. This leaves about 12½ per cent who have serious illness and an expense for wage loss and for medical care sufficient to constitute a real problem. Of these, many are able to meet the necessary expense from their own savings, by deferred payments or from regular income, just as they meet other extraordinary expenses. Thus it seems reasonable to assume that 5 per cent—certainly less than 10 per cent—of the total population are unable to meet their sickness expense without great sacrifice. This is still enough of a problem always deeply to concern organized medicine.

It is a testimony to the accuracy of these figures that when county medical societies have set up machinery to provide service for those otherwise unable to obtain it the number served has almost invariably been between 3 and 5 per cent of the total population.—*J. A. M. A.*



## PREOPERATIVE VISUALIZATION OF BREAST TUMORS

N. Frederick Hicken, R. Russell Best, Charles F. Moon and T. Tennyson Harris, Omaha (*Journal A. M. A.*, March 13, 1937), point out that tumors of the breast can be visualized in situ by contrast roentgenographic studies. The neoplasms are rendered visible by outlining them with such contrast mediums as stabilized thorium dioxide sol, lipiodine and air. This can be accomplished by injecting the milk ducts with the radiopaque substance and then making stereoscopic studies. The resulting roentgenograms, descriptively called mammograms, give an accurate anatomic pattern of the injected ductal system. Any pathologic condition that alters the size, shape or conformation of the lactiferous ducts is readily appreciated. Similar visualization studies can be made by inflating the breast tissues with air. This second form of study has been termed aeromammography. Tumors arising within or communicating with the milk ducts are best visualized by introducing stabilized thorium dioxide sol into the diseased ducts. The stereoscopic mammograms locate the tumor and portray its identifying characteristics. Tumors arising in the periductal tissue or those having no communication with the milk ducts can be visualized by inflating the breast with air. A large encapsulated lipoma was visualized by this method. A combination of the ductal injection and the insufflation of air produces the most satisfactory visualization patterns of the structures of the breast. Lipoma, fibro-adenoma, simple retention cysts, cystic degeneration of the ducts and carcinoma are some of the tumors that have been visualized preoperatively and diagnosed correctly.

## FOR WHOSE BENEFIT?

Every proposal for change in medicine should be tested with the question "For whose benefit?" Unless the change will help, either directly or indirectly, in the fight against disease and death, it cannot be justified. The fact that it may increase the income of physicians, help pay the interest on hospital investment, or provide salaries for a body of administrators, unless it will also improve medical service, is no justification. This is a simple test, but applied strictly to many of the proposals for medical changes before the public at the present time it would elicit a verdict of condemnation.—*J. A. M. A.*

## DO YOU KNOW?

Sickness and death rates for children and for persons in the employed age groups in the United States are much lower than in European countries including those countries in which government controlled compulsory health insurance, now proposed for Pennsylvania, has been in effect for 25 to 50 years.

\* \* \*

Deaths due to kidney disease, in both sexes, increase proportionately with age. There are three times as many deaths from kidney disease between the ages of 45 to 55 as there are between the ages 35 to 45 years.

## ELECTRICAL ALTERNANS: REPORT OF TWO ADDITIONAL CASES

The two cases that are the subject of the report by Jacob G. Brody and Phillip L. Rossman, Youngstown, Ohio (*Journal A. M. A.*, March 6, 1937), include one case of electrical alternans with demonstrable pulsus alternans and one case in which pulsus alternans was not demonstrated. Electrical alternans consists of a regular alternation at equal intervals, in contour or amplitude, or both, of successive phases of the electrocardiographic record. White says that electrical alternans accompanying pulsus alternans is rare; the QRS or T waves may rarely alternate in amplitude although not always in the same direction as in the arteriogram. Electrical alternans, like pulsus alternans is a sign of reduced myocardial reserve. It is of greater significance at slow or moderately increased heart rates than in extreme tachycardia. It may vary in degree, it may be continuous or transient. Electrical alternans, like pulsus alternans, is also found following premature contractions in some cases. The ease with which electrical alternans may be overlooked and the transient nature of the finding indicate the need for repeated tracings and careful study of records, especially of patients suffering from myocardial damage.

## AURICULAR FIBRILLATION: ITS INFLUENCE ON COURSE OF HYPERTENSIVE HEART DISEASE

Auricular fibrillation, the most common form of arrhythmia in hypertensive heart disease, occurred in 158 (25.3 per cent) of 623 patients with hypertension analyzed by Nathan Flexman, Chicago (*Journal A. M. A.*, March 6, 1937). It definitely influenced the course of the disease in forty-four patients (27.8 per cent) in whom the rapid irregularity preceded and precipitated the congestive heart failure and led to an early death from this cause within one month after the onset in eight (18.1 per cent) of the forty-four patients. When the auricular fibrillation occurred after congestive heart failure had been present from one month to several years, it had no apparent influence on the course of the disease except in relation to the cause of death and the comparative absence of additional occurrences common to appear in hypertensive patients.

## X-RAYS CURE TONGUE CANCER

Accessible cancers of the tongue can now be cured with only a few doses of low voltage X-rays, it was announced by Memorial Hospital, New York, where research leading to improved methods of treating cancer is being carried on by many scientists.

Formerly in cases of cancer of the tongue it was necessary to remove the entire tongue. Later radium needles were inserted and, while these cured the condition in many cases, the treatment was painful and not always satisfactory. Effective use of low voltage X-rays for this purpose has been developed within the last year.—*Science News-Letter*.

## Original Articles

### SOME UNUSUAL FEATURES OF LUNG CANCER

CECIL M. JACK, M. D., F. A. C. P.

DECATUR, ILLINOIS

Considering the high incidence of primary carcinoma of the lung in recent years, (as proved by autopsy material) the clinical diagnosis of these cases is alarmingly inadequate. There are three reasons for this: One, that the tumor is symptomless for a very long time. Second, that the symptoms that do develop are often not due directly to the primary tumor but to the indirect effect on the lung and pleural cavity. Third, that extensive metastases are so frequent that the first symptoms are often those due to metastases.

Early diagnosis is important in cancer in general, but in cancer of the lung it is of paramount importance for even the slightest improvement to be made in diagnosis. Considering the recent progress in thoracic surgery, it falls upon the clinicians to present the surgeons with operable cases.

In the reports of the few cases successfully operated on one finds that although the surgery was successful, the patient usually died of metastases within a few weeks or months.

Among the problems that present themselves in the early diagnosis of lung cancer, that of differentiating metastatic from primary tumors has not received the attention it deserves. The present discussion is limited to this problem.

Arkin and Wagner have recently reviewed this subject in the *Journal*<sup>1</sup> and Graham has reviewed the same subject from a surgical standpoint in the *Annals of Surgery*.<sup>2</sup> We note that primary carcinoma of the lung is one of the most frequent forms of malignancy in the adult population and that it is most frequent between the ages of forty and sixty. It is twelve times as frequent in males as in females. There are many of the opinion that lung cancer is definitely on the increase. The older clinicians rarely made a diagnosis of primary lung cancer and the pathologists considered the disease as rare. Statistics of recent dates, as compared with the older figures, have led to the conclusion that bronchogenic carcinoma is on the increase. It must be

considered, of course, that this increase may only be apparent, due to better methods of diagnosis, more correct diagnoses, recommendation of more such patients to hospitals, etc.

*Pathology:* Primary lung cancer takes one of three anatomic forms:

1. The hilus type, 2. the middle lung field type, and 3. the peripheral type. The differentiation of metastatic from primary lung tumors therefore involves a consideration of these three types, which are best discussed separately.

*Hilus type:* Primary carcinoma of the lung that occur in the region of the hilus are always located in the larger bronchi. (Fig. 1) They

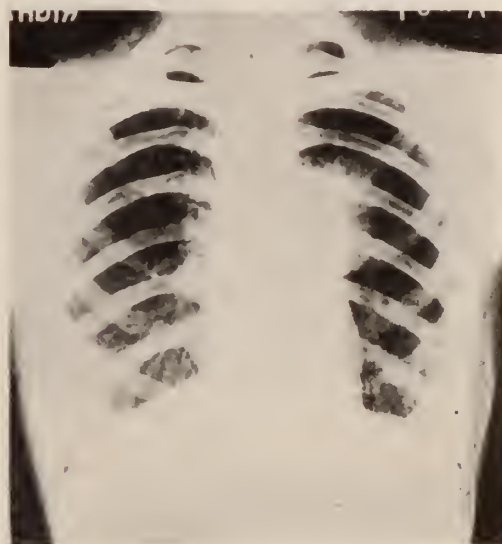


Fig. 1. Primary Lung Cancer—Hilus Type.

are squamous cell carcinomas that arise from the mucous membrane. They are annular carcinomas of the bronchi (much like carcinoma of the intestine) and produce stenosis of the lumen. The symptoms that develop result from this stenosis or narrowing of the lumen and depend on the secondary changes in the lung tissue supplied by the bronchus affected, namely, atelectasis or infection. Lesions that must be differentiated from such a tumor are, therefore, those that produce stenosis of the bronchus.

*Middle field type:* Primary carcinomas located in the middle lung field are usually also squamous cell carcinoma derived from the mucosa of the smaller bronchi, but also may be undifferentiated round cell carcinoma, or adenocarcinomas derived from the mucous glands of the bronchi. They are more prone to appear in the form of a distinct tumor node. (Fig. 2.)



Other lesions located in the middle lung field that must be differentiated from them include most frequently:

1. A single metastasis to the lung from a primary carcinoma or sarcoma elsewhere. Hypernephroid carcinomas (so-called hypernephroma) of the kidney are prone to metastasize to the lung because they invade the renal veins. Often they produce slight or no local symptoms,

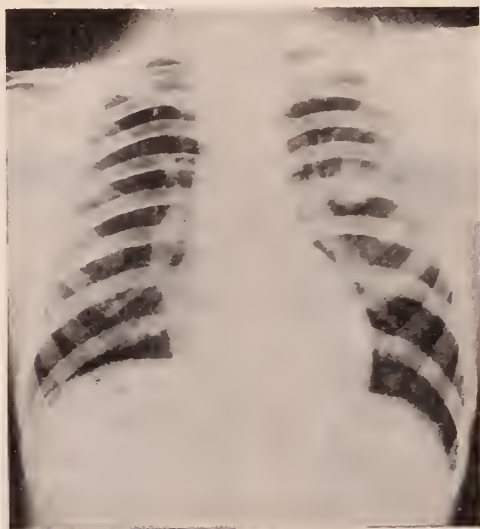


Fig. 2. Primary Lung Cancer—Middle Field Type.

and the first symptoms may be those of a metastasis to the lung. Sarcoma, especially Ewing's sarcoma of bone, may do the same thing. Carcinomas of the thyroid are also prone to metastasize to the lung. Of course, metastatic carcinoma to the lung is usually in the form of multiple nodes, and therefore they offer no difficulty.

2. Tuberculosis may sometimes offer a diagnostic problem, but not as a general rule. However, it must be kept in mind that a caseous tuberculosis of the lung may sometimes (rarely) be present in addition to a carcinoma, and may almost completely obscure it.

**Peripheral Type:** The peripheral form of primary lung carcinoma is the most difficult to diagnose clinically because it may be symptomless for a long time. The histology is the same as the middle lung field type. Because of its location, it affects only the local lung parenchyma in which it is located, with few symptoms. (By contrast, an even smaller carcinoma compressing a bronchus at the hilus may affect a whole lobe or a whole lung). Peripheral carcinomas of the lung develop symptoms, however, after they have

involved the pleura. The tumor spreads along the visceral and parietal pleura in the form of a carcinomatous lymphangitis, until large areas are involved. Pleural symptoms, fluid, etc., then develop. (Fig. 3) Diagnosis may be facilitated

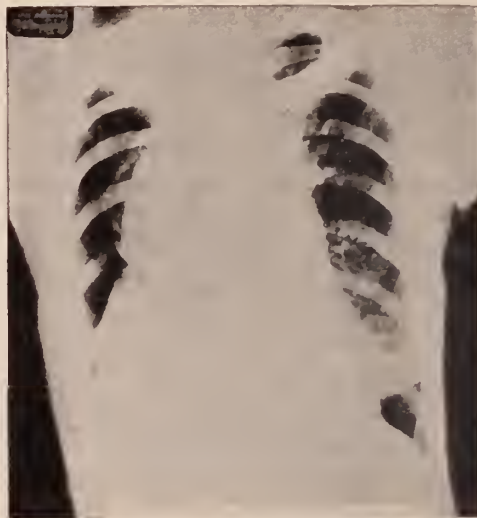


Fig. 3. Primary Lung Cancer—Peripheral Type. Pleural effusion replaced by atmospheric air. The apical process involves all pulmonary zones to the periphery.

by finding tumor cells in the aspirated fluid. Other lesions that must be differentiated from primary carcinoma of the peripheral type are, therefore, those that involve the pleura. Metastatic lesions to the pleura are of more importance. Carcinoma of the prostate may metastasize to the pleura, (a fact that is not often appreciated) in the form of a carcinomatous lymphangitis of the pleura and even of the lung. This also occurs frequently in carcinoma of the breast. The rich lymphatic supply of the breast penetrates the chest wall to the pleura. In late states of carcinoma of the breast the pleura (both visceral and parietal) is often greatly thickened by carcinomatous lymphangitis, and the lung is shrunk into a small knob against the hilus, the pleural cavity being filled with fluid.

The subject of carcinoma of the lung is important, as it concerns the future of many who are doomed to die a cancerous death. Earlier and better diagnosis will reduce the number of useless operations on patients who already have secondaries in the lung. I refer especially to carcinoma of the breast.

The symptoms of lung cancer depend on the location and size of the primary tumor, the secondary changes that so often occur, and the lo-

cation of the metastatic growths. Some cases have no symptoms while others may begin with a frank hemorrhage. Hemoptysis in a patient over forty should be considered cancer until proved otherwise. Pain in the chest is important, especially when aggravated by percussion. Dyspnea, cough, loss of weight and weakness are always suggestive. Our first aid in diagnosis, after a well taken history and physical examination, are properly interpreted stereo-x-ray films. The primary growth may be small, yet the x-ray may show the whole chest filled with metastasis. The efficiency of the x-ray may be increased by lipiodol injections. Artificial pneumothorax may also give aid, and the bronchoscope must be used if we hope to diagnose primary bronchogenic cancer early, for it is only on early diagnosis that we can hope to receive benefit surgically.

I wish to illustrate by use of the lantern, showing slides taken from the x-ray films of patients on whom this paper is based.

Case 1. A typical bronchogenic carcinoma. In the right upper lobe is found a homogeneous shadow of uniform density, presenting a well defined margin. The first diagnosis was lung abscess, then dermoid cyst, and finally neoplasm. The patient was an ex-soldier, aged 35, who died one year later—a cancerous death.

Case 2. To illustrate a typical metastatic carcinoma of the lung. (See Fig. 4)—Stereo-films of the chest



Fig. 4. Secondary Lung Cancer—The site of the primary lesion was not determined ante mortem.

show both lung fields extensively involved with rounded densities of varying size, many being discrete while others have blurred margins. The lower lobes show the greater involvement. This patient was a colored male who later died a cancerous death. An autopsy

could not be obtained; however, it illustrates metastasis to the lung which may come from cancer of the testis, ovary, thyroid, urinary bladder, liver and sarcoma of bone.

Case 3. This patient, a boy, aged twelve years, illustrates a metastatic sarcoma of the middle field type. The diagnosis was made by aspiration of cancer cells from the primary growth. Patient presented himself with pain and swelling in the right shoulder. The swelling was semi-fluctuating and very tender to pressure. A puncture was made for pathological report which was as follows:

"Many groups of malignant tumor cells scattered among blood clots. They are differentiated round cells with hyperchromatic nuclei, a narrow rim of cytoplasm, and many atypical mitotic figures. A small round cell sarcoma (probably a Ewing's sarcoma of bone.) Stereo-films show secondary growths in the lung."

Case 4. Lung carcinoma in a patient who had had a breast amputation. When chest symptoms developed, metastasis to the lungs was naturally suspected. But first it was necessary to disprove tuberculosis. The patient, a female aged 45 years, was admitted to the Macon County Sanatorium for chronic active pulmonary tuberculosis. Her mother had died of cancer, and she, herself, had had a breast amputation. She complained of cough and a temperature which had continued for two months after an influenza attack. She had lost fifteen pounds in weight. Stereo-films of the chest showed soft flocculent clouding with bronchopneumonic characteristics. There was fluid at the left base with pleural thickening. The aspirated fluid was clear. Guinea pig inoculation was negative. A later film showed a uniform density over the whole left chest. Pain developed in the hip and a film of this part showed typical secondary involvement of the bone. This patient is still alive, and could have been left in the Sanatorium to die a tuberculous death had the x-ray film of the hip not disclosed the true nature of the disease. Her last chest film showed pleural involvement, with the ribs no longer sharply defined. She is now becoming blind, suggesting brain involvement.

(Note) Since preparing this paper this patient has died, and the autopsy showed:

1. An annular carcinoma of the bronchus of the left upper pulmonary lobe, with extension to the bronchus of the left lower lobe.

2. Marked stenosis of the bronchus by the tumor with complete atelectasis of the entire left lung.

3. Suppurative bronchitis and peribronchitis.

4. Carcinomatous lymphangitis of the pleura of the left side, with complete obliteration of the pleural cavity.

5. Extensive metastases to the brain, ribs, right femur, pancreas, right adrenal and peritracheal, and upper abdominal lymph nodes.

Case 5. Again illustrates the difficulty which may arise in differentiating between tuberculosis



and carcinoma. The preceding case was in the cancer age. This patient, aged 21 years, is in the tuberculous age. In 1929 she contracted influenza, from which she never regained her strength. Under observation she presented the following:

1. Medium moist rales at the second left intercostal space.

2. Recent loss of weight.
3. Daily rise of temperature.
4. Small hemoptysis.
5. Small x-ray lesion.
6. Severe left intercostal pain radiating to left arm.

Serial x-ray study showed her lesion to be increasing in size. It gradually took on the characteristics of malignancy and it became necessary to control the pain with opiates.

According to the diagnostic standards of the National Tuberculosis Association, it was necessary to make a diagnosis of minimal tuberculosis. She was, however, given an additional diagnosis of "Under observation for Primary Lung Cancer." This later diagnosis was made positive by stereoroentgenography; the hilum shadow was increasing rapidly as well as assuming tumor form. It responded favorably and markedly to a single full series of deep x-ray therapy.

The findings after observation were as follows:

1. No rales in either lung field.
2. Ten consecutive negative sputum examinations.
3. Rentgenographic evidence showed left lung tumor.
4. Lessening of the left chest pains.
5. Slight expectoration.
6. Temperature within normal limits.

Case 6. This case illustrates a carcinoma of the peripheral type. The patient was a female, aged 65 years, who two months before examination had a sudden onset of malaise, breathlessness, with soreness in the right chest. There was a moderate cough with expectoration but no hemoptysis. Physical examination showed a large right pleural effusion. Stereo-ray films showed a uniform density up to the clavicle. Above the clavicle, pleural thickening was suggested. Aspiration of 3000 c.c. of bloody fluid was made, and the centrifuged sediment showed numerous anaplastic malignant tumor cells. Following aspiration, the lung did not re-expand, and another film taken was characteristic of pneumothorax. The fluid reformed and symptoms of brain involvement ensued. Death occurred three months after first observation. Autopsy showed a primary carcinoma of the right apex infiltrating into the pleura and involving practically the entire visceral and parietal layers of the right chest which resulted in the effusion. There were many metastases to the liver and also the diaphragm.

Time has not permitted more than a meager presentation of these few unusual cases which

were selected from the records of the Macon County Sanatorium, the Decatur and Macon County Hospital, and from my private practice.

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#### DISCUSSION

Dr. Harry Magee, Peoria: This is an interesting subject because,—first, 10% of all carcinomas occur as primary carcinoma of the lungs; second, 2% of all autopsies reveal primary carcinoma of the lung; third, four years ago only 5% of these cases were correctly diagnosed while today 75% should be correctly diagnosed.

The increase in percentage of correct diagnoses over this period is due to:

1. Recognition of early symptoms presented.
2. The aid of x-ray since its discovery in 1896.
3. The improved methods in the introduction of iodized oil into the lungs.
4. The use of the bronchoscope.
5. Pneumothorax.

Weller says that primary carcinoma of the lungs is the most intriguing of all classes of carcinoma. The same general laws apply to this condition as to all other internal malignancies.

Those carcinomas occurring in the hilum region spring from the bronchial epithelium or bronchial mucous glands. They extend outward toward the periphery in a fan-shaped fashion and usually show some atelectasis distal to the infiltrated area. These lesions metastasize rather late and have the best prognosis.

The lesions which spring from the alveolar epithelium are first seen in the periphery of the lung as round nodules. They metastasize rapidly and when they break into the pulmonary vein, they cause widespread hematogenous metastasis to distant parts of the body and may attack any organ.

The first symptoms of the disease may be those due to the metastases, with the primary lesion silent. When metastasis attacks the central nervous system, it may simulate any neurological lesion. The diagnosis is not made by relying on any one factor (Ewing) but the picture as a whole must be taken into consideration, with all of the diagnostic possibilities.

Early diagnosis can be made only by constantly keeping this condition in mind and by recognizing the first symptoms, which are usually those of a lung irritation, such as a cough, with or without expectoration, with or without bloody sputum, and the absence of tubercle bacilli. The early clinical picture very often simulates that of early tuberculosis. When secondary changes take place, we have the added symptoms of pleural involvement with intense pain and symptoms due to pressure, effusion and atelectasis.

Metastatic lesions in the lung due to a primary lesion elsewhere in the body occur from the following sources in the order named: bone, gastrointestinal tract, kidney, thyroid, prostate, and uterus. The metastasis in the lungs from these lesions are usually multiple, nodular and may be distributed anywhere throughout the lungs.

## RADIUM TREATMENT OF SECONDARY PAROTITIS

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Within recent years an increasing interest has been in evidence concerning the use of x-ray and radium in the treatment of certain types of infections. The number of inflammatory conditions in which this therapeutic method has enjoyed some success is gradually growing larger. The favorable results of this mode of treatment in furunculosis, carbuncles, erysipelas, cellulitis, various forms of granulomas etc. are accepted in most quarters but irradiation therapy of the parotid gland in secondary parotitis has not been so common. This is probably due to the difficulties of either transporting a bed-ridden patient to the roentgen ray department or of delivering an adequate depth dose of roentgen rays by means of the usual bedside unit. Radium however lends itself readily to this form of treatment and fortunately a large amount of radium is not necessary. In a recent paper Hodges indicates that "roentgen therapy in parotitis is about as specific as anything in medicine today and that other forms of treatment have not been at all satisfactory." For the above reasons this small series of cases of secondary parotitis treated by means of radium is reported.

Secondary parotitis is not common, but when it does occur, it usually affects patients who are already debilitated by disease, surgery, trauma or a combination of these conditions. The early literature on this subject suggests that parotitis usually occurred in females following surgery of the genital tract but it has also been pointed out that primitive surgery usually concerned itself with the female pelvis. More recently Rankin and Palmer have cited the increased frequency of secondary parotitis in surgery of the colon. They found 20 cases in 2,700 operations involving the colon in contrast with only two cases in 7,200 general surgical cases reported by Pique and three cases in 6,825 general surgical cases reported by Beckman. In general, however, this complication may apparently follow any type of surgery, being more common in the more serious operative procedures, especially if the pre-operative condition of the patient was poor.

Recent authors on this subject are in fair agreement that the infections originate in the mouth and reach the parotid gland by means of Stensen's duct although some writers express the opinion that emboli from a primary focus find their way to the parotid gland by way of either the blood or lymph systems. Other theories include 1. degeneration of the gland due to hyperpyrexia, 2. sympathetic reaction of the gland to ovariectomy etc., 3. the reaction of the gland to toxins produced by the primary injury and 4. trauma by the anesthetist. The last has ably been refuted by Combs, 1928. The duct infection theory appears sound because<sup>1</sup> as a rule bacteria, particularly staphylococcus aureus or albus are often present in the mouth and have frequently been recovered from infected parotid glands,<sup>2</sup> the general vitality of the patient is reduced,<sup>3</sup> the amount of secretion is lessened either by restriction of fluids as a pre-operative measure or by the use of drugs such as atropine. Further according to Talbot the parotid secretion contains no mucin which he considered the bactericidal element of the saliva. Besides this, the anatomic formation of the mouth explains the apparent immunity of the sublingual and sub-maxillary glands under similar conditions. Septicemia is only occasionally present while it should always be present if the infection is due to embolism. The experiments of Berndt, Buck and Buxton in which parotitis was produced by means of injection of bacteria into Stensen's duct in animals, are strongly corroborative of the oral origin of this disease. In a broad sense, however, the presence of secondary parotitis is usually indicative of a definite decreased resistance on the part of the patient.

Various types of treatment have been instituted with variable results. These include either warm or cold moist dressings, increased amounts of fluid, the use of chewing gum to stimulate salivations, more positive measures such as dilatation of Stensen's duct or surgical incision of the capsule of the gland to establish drainage. Recently Leithauser and Cantor reported the use of Lugol's solution given by mouth t. i. d. with excellent results although their series was too small to be entirely conclusive. X-ray or radium therapy has been discussed by Rankin & Palmer in 1930 with later reports by Reischauer, Desjardins, Pomeroy, Bowing and Fricke and

<sup>1</sup>Read before Section on Radiology of the Illinois State Medical Society, Springfield, May 20, 1936.



Hodges. All reported favorable results with a definite early decrease in the pain and swelling as well as a decrease in the mortality percentage.

The application of the radium in our series has been similar to previous reports on this subject except that it was modified to suit the amount and distribution of the radium at hand. We have one applicator containing 50 mg. of radium which is filtered by one millimeter of platinum and one applicator containing 30 mg. of radium, which is filtered by 0.5 mm. of steel and 1.0 mm. brass. These are placed on two blocks of wood 2.5 cm. square and 2.5 cm. in thickness and left on the area for 8 hours, making a dose of 640 mghrs. to each 2 sq. inches of skin surface. If the parotid swelling could not be covered by one set of these blocks, contiguous areas were treated in the same manner. In one case four such sets or a total dose of 2560 mghrs. was given to 8 sq. inches. The treatment should be applied as soon as possible after the diagnosis is made, in fact, it should almost be considered as an emergency measure. Roentgen treatment may be used if radium is not available although the difficulty of transporting a very sick patient to the roentgen therapy room presents itself. No factors were noted in the literature in regard to the roentgen ray technique but a 40 to 50% erythema dose through 4 or 6 mm. of aluminium at moderate (135 K. V.) voltage should be effective.

The theoretical effect of radiation therapy has to do with the marked radio sensitiveness of the leucocytes, particularly the lymphocytes. It has been repeatedly demonstrated that the presence of a leucocytic infiltration is necessary before this form of therapy can be effective. Histologic study of the normal parotid gland also reveals frequent plasma cells and large amounts of lymphoid tissue distributed throughout the salivary gland between the acini elements. Each of these types of cells are generally considered relatively radiosensitive. It is presumed that the destruction of these cells will liberate antibodies or antistances which can more readily combat the infection than the same material contained in intact cells. The greater the leucocytic infiltration the greater should be the effect of irradiation. Warthin, Heineke and Maximow have demonstrated the very early breaking up of the leucocytes after roentgen therapy. It is

also a possibility that the various radiosensitive cells are reduced in size which in turn would permit increased drainage through the ducts by a reduction of pressure.

The use of this form of therapy is a positive therapeutic measure which very frequently causes a decrease in the amount of pain and swelling within twenty-four to forty-eight hours. There are no definite contraindications, hence it may be carried out on patients who are extremely ill. The necessity of incision for drainage is decreased in frequency on those treated by this means according to Bowing and Fricke.

The determination of the real percentage of deaths in any given series actually due to the secondary parotitis is almost impossible. In the various reports on this subject the authors have attempted to explain their mortality on the basis of gross mortality in their series as well as an actual mortality due to secondary parotitis alone. This seems difficult because in almost every instance the primary condition alone is sufficient to explain the death of a patient.

Case 1. in our series is an instance which makes this difficulty apparent. A female, aged 21 years, was admitted to the Methodist Hospital for an appendectomy. An acute dilatation of the bowel occurred several days later and an enterostomy was performed. This was followed after several days by a left parotitis, later by a right parotitis and a marked stomatitis. The patient died and at autopsy an adenocarcinoma of the sigmoid colon causing partial obstruction was found. Death was very probable without the presence of parotitis. It therefore seems more logical for us to compare the mortality percentages on the basis of gross mortality in each series rather than attempting a separation by other data. On that basis Rankin and Palmer, Bowing and Fricke and Pomeroy report the use of radium in a total of 190 cases with a gross mortality of 42 or 22%. Other forms of therapy were used by Hobbs and Sneierson, Blair and Padgett, Padgett, Fisher and Leithauser and Cantor in a total of 95 cases with 34 deaths or a percentage of 35.8%. Green gives the combined American Statistics compiled before the use of radium or x-ray as therapeutic measures as 58% mortality.

The above table is almost self explanatory. The gross mortality was 16.6% of all cases or 20% of those cases occurring postoperatively or following traumatic lesions. It is apparent, however, that death occurred in each instance to patients who would most probably have succumbed regardless of whether or not their condition was complicated by a secondary parotitis. According to that viewpoint the mortality due

Patient	Age	Sex	Primary Lesion	PAROTITIS			Date of RX	Amount of RX	REMARKS
				Complication	Dev.	Side			
R. McW. . . . .	20	F	Appendectomy Enterostomy 4/14/33	Bil. Stomatitis	4/17/33 3	Bil.	4/19/33 48 hrs. later	1920 Total 960 to ea. side	Patient died 4/25/33—little relief. At autopsy a Ca. of the sigmoid was found. Note the presence of stomatitis. General condition—very bad.
E. O. . . . .	62	F	Expl.—Ca. Head of Pancreas 10/2/35	Cholecho- stomy Cholecyst gastrostomy with T. tube	10 5/35 3	Bil.	10 5/35 within 12 hrs.	1100 mg. hrs.	Patient moribund at beginning of RX. RX not completed. Patient died 10/7/35 early in the A. M.—Slight stomatitis.
J. H. D. . . . .	62	F	Ac. Appendicitis with perforation 11/3/35		11 5/35 2	Left	11 8/35 5 days	2560 8 blocks	Pain and swelling reduced regularly. Temp. subsided quickly. Discharged well 12/10/35. General condition—fair.
A. N. . . . .	59	F	Hysterectomy and aut. and post Colporrhaphy, etc., 6/20/35		6/20/35 1	Left	6 22/35 48 hours	960 mg. hrs.	General condition—good. Definite relief. Discharged well 7/8/35.
H. H. . . . .	7	M	Rupt. Gang. Appendicitis 9/10/35	Acute Nephritis	9 15/35 5	Left	9/15/35 within 12 hours	960 mg. hrs.	General condition—fair. Results good. Discharged 10/9/35.
J. B. . . . .	28	F	Acute Appendicitis 2/4/36		2/7/36 3	Rt.	2/7/36 in 12 hrs.	1440 mg. hrs.	Incision 2 12/36 necessary for drainage. Small amount of pus. Discharged as well 2/29/36.
P. . . . .	67	F	Cholecystectomy		4 2 36	Left	4/4/36 in 48 hours	640 mg. hrs.	4 6 36 parotitis subsiding. Very gradual reduction in pain and swelling. Discharged—well 4/30/36.
R. L. . . . .	30	M	Basal Skull Fracture 5/30/35		6 10/35 10	Left	6 12/35 48 hours	600 mg. hrs.	Pain and swelling reduced gradually. Uneventful recovery. Discharged 7/3/35. General condition—good.
S. B. . . . .	87	F	Fracture left femur 7/4/35	Carbuncle, Hypostatic Pneumonia	7 23/35 19	Rt.	7/23/35 within 12 hours	960 mg. hrs.	Condition—fair. Pain and swelling gradually reduced. Discharged 9/22/35.
L. K. . . . .	81	F	Fracture right hip 11/23/35	Epilepsy H. & B. In- continence Broncho- pneumonia	12/29/35 36	Left	12/31/35 48 hours	1280 mg. hrs.	Well 1 5 36. Parotitis cleared up entirely. Developed a pneumonia 2/10/36 and died.
R. M. . . . .	24	M	No injury		5/8/35 5/14/35	Rt.	5 15 36	1280 mg. hrs.	No evidence of obstruction. First appearance 5/8/35. Subsided spontaneously. Second appearance treated by radium. No recurrence.
W. . . . .	64	M	No injury		5 10/35	Left	7/11/35 again 8/6/35	960 mg. hrs.	Sialograms negative for obstruction. First RX gave partial reduction. Consulted Mayo Clinic physician who advised further irradiation



to parotitis alone was nil. Rankin and Palmer have suggested that surgery of the colon is more often followed by a secondary parotitis and in those instances the condition is frequently fatal. In view of the fact that radical surgery of the gastrointestinal tract, naturally carries with it a high mortality rate, it would be expected that the mortality rate of its complications would be greater. It is not to be denied, however, that a secondary parotitis does place an additional burden on the patient and in occasional instances may be the factor which precipitates an unfavorable end result. It seems more logical to consider the presence of a postoperative parotitis as an evidence of decreased resistance to organisms frequently present in the mouth. It is to be noted that in both patients who died, the parotitis was bilateral and in one a well developed stomatitis was present. Unfortunately there is no satisfying method of determining the resistance of a patient to any one type of infection or condition, much less is it possible to compare the resistance of a number of patients to various types of infections or physiological states. For these reasons it is impossible to state what percentage of deaths are due to parotitis alone.

The frequency with which this method of therapy has caused a definite diminution in the amount of pain and swelling is sufficient cause for its use and seems to be the most important reason for its use. These changes are usually noted 24 to 48 hours after its application, sometimes within 12 hours. The relief of pain and swelling is usually accompanied by a reduction of fever and leucocytosis. There can be little doubt but that occasionally these benefits may be the means of extending the life of the patient, at least it places the patient in a much better position to cope with the primary disease or condition.

*Conclusions:* Ten cases of postoperative parotitis and two of subacute parotitis treated by means of radium are presented.

Radium or roentgen therapy is indicated in either postoperative parotitis or subacute parotitis because relief of pain and swelling has been frequently noted. The gross mortality rates are lower in those series in which radium was used although it is apparent that the percent-

ages of mortality is on an inadequate basis for comparison.

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## DISCUSSION

Dr. Herbert Schmitz, Chicago: We have been treating this surgical complication with x-ray, using a technic similar to that described by Dr. Cushway this morning. An application of 200 r using a quarter of copper filter plus 1 al. at 50 cm. F.S.D., repeating the treatment every second day, if necessary. The important thing, as the Doctor mentioned, is employing the treatment early in the disease. The minute the patient has any sign of pain or swelling the treatment should be used. Inasmuch as the swelling is not severe at this early stage, in the period of a week there is usually complete regression. Since using this treatment I have not seen a death which we could attribute to the complication of surgical parotitis.

Dr. H. A. Olin, Chicago: I would like to ask Dr. Decker a question in connection with the young girl twenty years old who had her appendix removed. Was there any clinical evidence of obstruction or any clinical evidence related to carcinoma of the sigmoid before the appendix was removed?

Dr. Decker: I did not get in on the case until later but there must have been evidences of obstruction or the enterostomy would not have been done. The parotitis developed after the enterostomy.

Dr. E. P. Halley, Decatur: In connection with treating parotitis as described by Dr. Decker, radium is, I imagine, the energy source of choice because the patient is too ill to be removed to the x-ray department. I do not know how Dr. Schmitz manages to get them there but our surgeons will not let us move them.

Following Dr. Faust's work on gas bacillus infection, the use of the portable or bedside unit as a practical source of therapeutic energy was a novel idea to me. We have just recalibrated a new tube on the bedside unit. It was interesting to learn we could get as much as 17 r at 40 cm. through a millimeter of aluminum at 90 kv and 5 milliamperes. The ordinary radiographic tube of medium focus is rated for about ten minutes continuous operation on fluoro-

scopic settings (85 kv. p. 5 ma.). That gives a pretty good dosage that is available for these patients. I am going to use it in parotitis the first opportunity I have and would like to know what sort of results could be obtained with that type of radiant energy in other hands.

Dr. Cesare Gianturco: Dr. Decker's interesting summary of his results with radium therapy of surgical parotitis brings a question to my mind.

I am under the impression that most workers use radium instead of Roentgen rays in the treatment of surgical parotitis on the assumption that radium is easier to use on debilitated patients who cannot be properly handled. It is true that radium can be applied without moving the patients, but the applicators must be maintained in place by adhesive tape and bandages for hours at the time, and this causes a certain amount of discomfort. I wonder whether it might not be just as easy to have the patient brought in his own bed to the Roentgen ray department where in a few minutes one could deliver a dose which would take hours if given by means of radium. I would like to ask Dr. Decker whether there is a difference in the results obtained by radium and those obtained by using Roentgen rays.

Dr. Decker: As far as the dose is concerned, it seems at least the treatment technique I read about, calls for considerable more depth dose than would be given by eighty or ninety or even one hundred K. V. through one millimeter aluminum.

There was only one place where I could get some idea of the technique used by using x-ray and that was at Hines Hospital. There they also used more filtration than one or two millimeters of aluminum. There is no question whether the radiation is the same in this type of case as that which was discussed by Dr. Holley, in relation to gas bacillus. We have to produce the definite change in the cells themselves and I doubt whether we are going to get enough by using one millimeter of aluminum.

Dr. Gianturco mentioned the fact it was uncomfortable for the patient. I think if you use the blocks I mentioned, two at a time, which I had to do on account of the small amount of radium in my possession you will not make the patient uncomfortable. The radium is taped on so the patient can assume practically any position he or she wishes.

Just as the dentist was leaving his office the telephone bell rang. He answered it and found that it was a patient wanting to come that afternoon. "I'm afraid I can't give you an appointment for this afternoon," the dentist replied. "I have 18 cavities to fill."

And he hung up the receiver and hurried off to the golf course.

"The process of thinking draws the blood from the feet to the head," an educator informs us. This explains, perhaps, why, in so many cases, if you think twice about a proposition, you get cold feet.—*Atlanta Journal*.

## CHRONIC SINUSITIS IN CHILDREN

J. R. LINDSAY, M. D., C. M.

CHICAGO

During the past fifteen years or more the question of chronic sinus disease in the child has been the subject of much careful investigation and study, with the result that it is now recognized as a diagnostic possibility in a considerable number of pediatric conditions. It has also become one of the common conditions which the rhinologist is called upon to treat, and presents problems from the standpoint of diagnosis, treatment and general care for which the solution may be far from simple.

The contributions of such observers as Dean,<sup>1</sup> Richards,<sup>2</sup> Carmack,<sup>3</sup> Clerf,<sup>4</sup> Watson-Williams,<sup>5</sup> and many others are well known. They have shown that sinus disease among children is nearly as frequent as in the adult. Statistical studies by Dean,<sup>1</sup> Watson-Williams<sup>5</sup> and Carmack,<sup>3</sup> indicate that empyema of one or both antra is to be found in 15 to 20% of children who come in for routine removal of tonsils and adenoids. From the standpoint of treatment and prognosis the reports to be found in the literature serve to emphasize the fact that there is no simple method of treatment which can be universally applied but that each individual case presents its own problems as to therapy.

We have recently made a review of some 200 cases of chronic sinus disease in children of 13 years and under which have been treated in the University Clinics during the past five years. Particular attention has been paid to the symptomatology, the method of establishing the diagnosis, the type of treatment and the after results, both immediate and in later years. Rather than attempt to present any statistical report of these cases, certain general features will be discussed and selected cases will be presented to serve as illustrations.

Acute sinus disease and osteomyelitis have not been included in the group, except where there has been a question of diagnosis.

Infection in the paranasal sinuses occurs when there is a relative disproportion between the re-

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Read before the Section on Eye, Ear, Nose and Throat, Eighty-sixth Annual Meeting, Illinois State Medical Society, Springfield, May 20, 1936.



sistance of the individual to infection and the virulence of the infecting organisms. The infection becomes chronic in nature when the defense mechanisms of the body are insufficient to overcome it. Predisposing factors may be present and may be both general and local. Such factors as vitamin deficiency, endocrine imbalance and allergy have been much discussed as predisposing and as causative factors. There can be no doubt that these conditions along with general hygiene, proper housing conditions and climate, play an important part in the predisposition to infection in the upper respiratory tract.

The local predisposing factors consist in any condition which inhibits the normal action of the ciliated epithelium with its coating of mucus, such as the presence of an infected obstructing mass of adenoid tissue, or hyperplastic and polypoid changes in the mucosa, usually found secondary to allergic rhinitis.

Physical and chemical factors, such as the overheated dry atmosphere in most dwellings in the winter season, and perhaps to some extent the indiscreet use of various medicaments have been shown by Proetz,<sup>6</sup> Lierle and Moore<sup>7</sup> and others to have an inhibitory action on the cilia and no doubt may play a part in the onset of infection.

We have made it a routine to culture the pus from the sinus cases as a preliminary to irrigation. The organisms most commonly found have been green streptococcus, hemolytic staphylococcus, pneumococcus, micrococcus catarrhalis, influenza bacillus and Friedlander's bacillus. In the case where foul-smelling pus is found anaerobic organisms may be cultured.

The symptomatology of chronic sinus disease in the child is subject to great variation. In winter there is usually nasal and post-nasal discharge and repeated colds, but in summer there may be very little discharge or obstruction. The local nasal symptoms are frequently overshadowed by other more severe general symptoms such as cough, laryngitis, bronchitis, beginning bronchiectasis, by middle ear disease, or by infectious processes in more remote parts of the body such as arthritis or nephritis.

Every case of chronic cough, bronchitis, bronchiectasis or asthma should have an examination of the sinuses. It has been our experience

that the x-ray examination of the sinuses in these cases is of great importance, inasmuch as not infrequently an empyema of one or both antra may not be evident on the local examination.

The importance of recognizing and clearing up the sinus infection in the cases of asthma and chronic bronchitis or beginning bronchiectasis cannot be stressed too strongly. The role of the long-standing sinus infection in the production of a bronchiectasis is well established and the importance of taking adequate steps to clear up or control the infection in the upper respiratory tract before permanent damage has been done in the lungs cannot be given too much emphasis, inasmuch as treatment after the bronchiectasis has developed will only be palliative.

With the exception of the acute fulminating infections which exhibit signs of complications such as an orbital cellulitis, cavernous sinus thrombosis or a beginning osteomyelitis, the x-ray examination does not furnish much essential information in the acute sinus infections. Many of the cases which show partial or complete clouding of antra or ethmoids during the acute stage may be entirely clear on x-ray examination after a period of three weeks. The local treatment should therefore be limited during this stage to such mild measures as shrinkage with weak ephedrine in normal saline, and the daily use of gentle suction. When the symptoms persist after three to four weeks, other measures must be considered.

In the case of large adenoids and tonsils the removal of these is frequently followed by a clearing up of the sinuses. We have often washed the antra at the same time as the tonsil and adenoid operation when dealing with a child in whom the antrum irrigation could not be conveniently done under local anesthetic. It is open to question whether the clearing of the sinuses in such cases might not have resulted after the tonsil and adenoid operation alone.

We have made a weekly x-ray examination in a few cases following the acute sinus attack and have observed completely clouded sinuses become clear in a period of three to four weeks with no local treatment.

In the case of the allergic child, as well as in the adult, we have occasionally found complete

clouding of antra on x-ray, and on antrum irrigation have found only clear sterile mucus. In such cases we have invariably found that the examination of the nasal secretions showed an eosinophilia of 90% or over. As we have previously reported<sup>9</sup>, we find that the examination of the nasal smear in any doubtful case is a quick and simple way of differentiating between infection and an allergic reaction. Cases of infection invariably show a preponderance of neutrophils in the smear. The nasal reaction which is purely allergic does not require surgical measures in the young child. It is not infrequent in older children however to find that polypoid changes have occurred in any or all of the sinuses, and although the predisposing factor may have been allergic, the superimposed chronic infection should be controlled and usually requires some form of surgery. Cases are not infrequently seen where the simple removal of the pus from an antrum is followed by a marked regression of allergic symptoms.

The local treatment of a chronic sinus infection in the child depends on several factors. Under the age of six or seven years it is usually limited to the use of shrinking solution such as 1% ephedrine in normal saline and to the use of mild suction where possible. Antrum irrigation may be carried out but usually requires a general anesthetic. Fortunately, children up to this age usually respond well following removal of hypertrophied and infected tonsils and adenoids and where proper diet and hygienic conditions are provided. The effect of general care on the sinus condition has been well demonstrated in a few of the orthopedic cases taken from unfavorable home surroundings and sent to the country home for crippled children for a period of weeks or months.

After the age of six or seven years it is frequently possible to irrigate the antra under a local anesthetic, either by way of the natural ostium or through the inferior meatus. The latter route was formerly the routine procedure, but we are now using the natural ostium more and more because it is better tolerated by the child. In children who are uncooperative we have used the antrum window in the inferior meatus, made as large as possible by means of biting forceps. If the child is over 8 years of age the majority of the windows will remain

open, if adequately made. In many cases the windows will soon close, but may remain open long enough to allow the infection to be cleared up. In occasional cases it has been found necessary to make new windows.

In some cases we have removed the anterior end of the middle turbinate to provide better drainage, and in a few of the older children a partial ethmoidectomy has been necessary. It has been our experience however that in the majority of the cases, the relief of the empyema of the antra has been followed by relief of the symptoms. Where polypoid changes have already occurred in the lining membrane of the sinuses, the antrum window operation may be inadequate as a permanent relief, but may permit more thorough treatment until development has progressed enough to allow a more radical operative procedure.

The circumstances surrounding each particular case have much to do with the type of treatment which can best be followed. In the case of cooperative children where irrigation through the ostium or middle meatus is easily carried out and where proper hygienic measures in the home are possible, it may not be necessary to resort to any operative procedures.

In the case of recurring asthmatic attacks or a persisting chronic bronchitis however it becomes the duty of the rhinologist to take adequate steps to relieve the sinus infection whether it involve operative procedures or not. The after treatment in any case is likely to be prolonged and tedious. Each upper respiratory infection may light up the symptoms and necessitate a further course of local treatment.

The cooperation of the pediatrician is of great help in the regulation of diet and general hygienic measures.

The question of specific immunity to infection is still in the course of investigation. Recent work on local immunity by Cannon and Walsh,<sup>9</sup> Bull and McKee<sup>10</sup> and others has revealed significant findings regarding the line of defense set up by the cellular reaction in the tissues in response to intranasal vaccine therapy.

During the past three years we have found that the use of a stock vaccine sprayed into the nose has apparently resulted in a very definite decrease in the number of acute infections of the upper respiratory tract and consequently a



very marked improvement in those cases of chronic sinusitis who were subject to frequent exacerbations from early fall to late spring.

We have found it necessary to do a radical antrum operation in only a few of our cases and then only in patients of 12 or 13 years of age.

In checking up the condition of the antrum after a radical operation has been done, with removal of the lining mucosa, we have found considerable variation in the end result. In all of the cases the density as shown by the x-ray is greater than normal. In some of the cases a large antrum is still present, with a healthy lining. In many of the cases however, the lumen of the antrum has been either greatly decreased in size, or, in some cases, obliterated, by growth of fibrous tissue. The end result in either case may be equally good. The character of the lining epithelium is probably of greater importance than the size of the lumen.

Most of the remarks in this discussion have been directed to the maxillary antrum. As previously stated it is frequently necessary to remove part of a middle turbinate in the small child, or to open up or remove ethmoids in the larger children, but although the ethmoid may be of great importance in the development of a chronic sinus infection, the relief of the infection or empyema in the antrum seems to be most commonly the fundamental part of the local treatment.

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#### DISCUSSION

Dr. Theo E. Walsh, Chicago: The function of a

discusser of a paper, provided he agrees with what the essayist has said, is, I believe, to emphasize those points that seem to him to be important, which the essayist has for very lack of time only touched upon. I need hardly say that I agree with what Dr. Lindsay has said, and I would like to bring to your attention two points in his talk.

The first, that there are means at our disposal for the prevention of sinusitis; of the acute disease by the use of vaccine, of the chronic by the adequate and rational treatment of the upper respiratory infection that is the forerunner of chronic sinusitis. It is true that a survey of the literature on anti-cold vaccines leaves us very skeptical of the value of such medication. The consensus of opinion is that while some individuals are most definitely helped by the administration subcutaneously of either stock or autogenous vaccines, such treatment in the majority of cases has no value in the prevention of colds. For the last few years I have had the privilege of working with Dr. Paul Cannon on some problems in local immunity and our results led us to believe that possibly the method of administering vaccine is at fault and accounts for the poor results obtained. Briefly, we found that following the intranasal application of vaccine in rabbits specific antibodies can be demonstrated in the nasal mucosa and that such a mucosa on histologic section shows a remarkable accumulation of phagocytic cells. Further, that rabbits that have been treated by the instillation of vaccine into the nose are extremely resistant to intranasal infection with a virulent organism. Hoping that this might prove true in humans we have for the last four years been using a polyvalent vaccine as nasal spray for the prevention of colds. To date, of some 300 patients treated, 80% have had no colds who in previous years suffered from more than three severe upper respiratory infections. We feel, therefore, that although it is too early to draw any definite conclusions as to its efficacy, the method of intranasal vaccine spray is worthy of a trial.

In dealing with acute upper respiratory infections and sinusitis, I feel that one cannot emphasize too strongly the physiological approach to treatment. The work of Proetz, Hilding, Lierle and Moore and others, has emphasized the ruinous effect on the nasal cilia of most of the more popular local applications. The thought that the silver preparations so commonly advocated for children, the camphor, menthol, eucalyptol, etc., present in all the preparations on the drug store counter, actually deprive the individual of nature's first line of defense, e. g., the action of cilia and mucus, most surely give us pause. Particularly when we have at our disposal so adequate a shrinking solution as a weak ephedrine in saline which has been shown rather to stimulate the ciliary action than to depress it, and such simple means of effecting drainage as gentle suction and the effect of posture.

The second point which I feel can be emphasized is the tragic result of neglected sinusitis in children. Dr. Lindsay has shown the chest x-rays of a girl with bronchiectasis. The tragedy of such a case is

made doubly distressing by the knowledge that the condition is in most instances preventable. Adequate treatment of the original sinusitis could have given the girl not only the expectation of a normal length of life but also a life free from the distressing cough and foul sputum which makes her almost a social pariah.

Dr. T. C. Galloway: Chronicity is alien to the vigorous conditions of the young and persistence of sinus diseases in children, in the absence of osteitis, usually means persistence of the cause. Of the causes already mentioned I think infected tonsils and adenoids and allergy are of most importance.

The relief of these should be strongly emphasized before resort to sinus operation. I think however removal of tonsils in the presence of active nasal allergy occasionally makes it much worse.

Infection superimposed on allergy and allergy to infection make difficult situations in which active sinus treatment may be necessary—even operation.

Dr. Lindsay has given a very fair statement and the antrum window operation as described is the one to be done when indicated.

Dr. George Woodruff, Joliet: I enjoyed Dr. Lindsay's paper very much. In private practice I do not think many of us have the opportunity of seeing children with ordinary chronic disease very frequently. We are more apt to see them when they develop some complication like swollen eyelids or orbital complications. One thing to which I would like to call attention is the lateral head-low position of Parkinson in using 1% ephedrine solution in normal salt. It might be of use in children where you cannot use a more strenuous treatment.

Dr. O. E. Van Alyea, Chicago: I think the essayist has thoroughly covered the subject. Dr. Woodruff mentioned the lateral side posture of Parkinson. I have had occasion to try that with children with acute coryza without involvement of the sinuses. I think it is the most successful treatment we have in children up to this time. Parkinson described it in 1930 in the *Journal of Pediatrics* and in last month's *Archives of Otolaryngology*. He recommended its use in the treatment of adults with nasal infections. I have tried it in both children and adults with success. I use a solution of 1% ephedrine in normal saline. It seems most pediatricians recommend dropping argyrol in the nose, or using some oily inhalent. Parkinson discusses these medications at great length, and basing his conclusions on the investigations made throughout the country the last few years, he deprecates the use of these substances. I think it is a good plan to adopt the use of this saline-ephedrine solution in children; it can be used in sinusitis and in simple coryza. The patient is laid on his side with his shoulder on a pillow so that the head is lower than the shoulder and so that when the lower nasal cavity is filled the ostia are entirely covered with the solution. Mild suction, if you wish, will permit the solution to enter the sinuses themselves.

Dr. Walter Stevenson, Quincy: My few remarks

are not a direct discussion of Dr. Lindsay's paper. I heartily agree with everything that he has said. However, in view of the widespread indiscriminate use of organic preparations of silver in treatment of acute nasal conditions, I want to mention them merely to condemn their use. I feel very strongly about this because I have seen a number of cases of argyria, and as you know it is a deplorable condition which cannot be cured.

Dr. J. A. Oliver, Charleston: Most doctors use 1% ephedrine in normal saline. I cannot see any better result with 1% than with 0.5%. I would like to know if that is the experience of anyone else.

Dr. G. H. Mundt, Chicago: I think Dr. Stevenson sounded a very important note on the use of argyrol. If he has seen only three cases I am surprised. I have seen so many stains from the continued use of mild silver proteins that I think we should step on the use of that particular thing. This is a problem in pediatrics. This is a problem we must get over to the general practitioner, which is difficult. I am going to say that it is very difficult to get the general public to believe that anything has any efficacy in the handling of sinus infections, but handling these particular maxillary sinus infections in children has been very satisfactory. We must try to get it across. If we do not we are remiss in our duty. Dr. Lindsay said one thing we must stress. He said the x-ray examination was important. I thoroughly agree with him. We should not go into a maxillary sinus until a roentgenogram is made, but we certainly must not believe that the one way to make a diagnosis is to send the patient to an x-ray man for his report. I was pleased that he had such results by flushing at the time of the tonsil operation. This is important and should be broadcast to the general medical profession.

Dr. J. R. Lindsay, Chicago (closing): With regard to the strength of the ephedrine solution, I may say that we usually use 0.5% for small children and in larger children 1%. We do not prescribe silver preparations such as argyrol and neosilvol, but find a strong tendency among some medical men to use these preparations. We have only seen a few cases of argyria in children. We rarely remove any turbinate tissue in the chronic sinus cases in children.

The x-ray picture is a valuable aid in children. Empyema of an antrum is frequently found on x-ray in cases where the local examination might give no indication.

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Simmond's disease is a manifestation of deficiency of the anterior pituitary hormones. Herman had marked success with the use of anterior pituitary and anterior pituitary-like preparations, giving as high as 700 units daily. One patient, age 20, who weighed 73 pounds at the time therapy was instituted was so improved by pituitary therapy that she won a beauty contest one year later. Herman, K., *Am. J. Digest. Dis. & Nutrition* 3:382, 1936.



# TREATMENT OF MENINGOCOCCIC MENINGITIS WITH MENINGOCOCCUS ANTITOXIN

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The control of meningococcic meningitis has been an important medical and public health problem for many years. (See Table 1.) A very important advance in the treatment of meningococcic meningitis is the development within recent years of meningococcus antitoxin by Ferry, Norton and Steele.<sup>1</sup> These investigators found that meningococci produced a soluble toxin in laboratory media, which stimulated the production of a specific antitoxin when injected into laboratory animals. By injecting horses, they were able to produce the antitoxin in sufficient quantity for treating human beings ill with meningococcic meningitis. The serum which had been used in treating meningococcic meningitis prior to the development of meningococcus antitoxin was obtained by injecting horses with suspensions of living meningococci; accordingly, the resulting serum was antibacterial rather than antitoxic. The present conception of meningococcic meningitis is that the disease is caused by a toxin produced by meningococci which have initiated a generalized systemic infection, inasmuch as meningococci have been isolated from the blood stream in the early stages of the disease. According to this conception, the meninges become involved as a complication of this generalized systemic infection, rather than being the primary focus of infection.

TABLE 1. MENINGOCOCCIC MENINGITIS IN ILLINOIS 1926-1935

Year	Population	Cases	Deaths	Morbidity Rate,*	Mortality Rate *	Case Fatality %
1926	7,203,000	114	58	1.6	.80	50.8
1927	7,314,000	296	129	4.0	1.77	43.9
1928	7,396,000	456	223	6.2	3.04	48.9
1929	7,478,000	578	306	7.7	4.09	52.9
1930	7,658,590	445	208	5.8	2.71	46.7
1931	7,718,000	490	257	6.3	3.32	52.4
1932	7,768,000	322	156	4.1	1.96	47.5
1933	7,818,000	557	208	7.1	2.66	37.3
1934	7,876,000	337	119	4.3	1.51	35.3
1935	7,934,000	554	207	6.9	2.61	37.3

\*(Per 100,000).

Meningococcus antitoxin has been given an extensive therapeutic trial by Hoyne<sup>2,3,4</sup> at the

Cook County Contagious and the Municipal Contagious Disease Hospitals in Chicago. The antitoxin is first diluted in 10% dextrose or normal physiologic sodium chloride solution, then the injection is carried out slowly by the intravenous route. Doses of 60 c.c. are administered to children, while doses for adults range from 90 to 105 c.c. In addition to the intravenous injection, 20 or 30 c.c. of undiluted antitoxin may be injected intraspinally by the gravity method following withdrawal of a somewhat greater amount of spinal fluid. One intravenous injection may be all that the patient needs, but daily injections may be repeated if necessary. It is now felt that repeated spinal punctures are often injurious to patients with meningitis, and not more than one puncture should be done in any twenty-four hour period.

Early in 1935, meningococcic meningitis appeared in Springfield, which had been free of this disease for the preceding 21 months. On January 29, 1935, three residents of Springfield developed meningitis simultaneously. It was felt that the sudden occurrence of this disease warranted a special investigation by the Division of Communicable Diseases of the State Department of Public Health. Inquiries revealed that all three of these persons had attended an entertainment given by transients from shelters maintained in this city by the Federal Transient Bureau. Within a few days, two residents of the transient shelters also developed meningitis, which indicated that transients had probably brought the disease to Springfield. This outbreak in Springfield was a part of a general outbreak of meningitis which appeared during the early months of 1935 at several transient camps throughout this country.

Only one death occurred among the first five persons who developed meningitis. However, during the following six weeks eleven other persons became ill with the disease, and it appeared that the virulence of the causative microorganisms was increasing, inasmuch as death resulted in nine of the eleven cases, in spite of the employment of antimeningococcus serum by the intraspinal route. Accordingly, during the early weeks there were sixteen cases in all, with ten deaths, a fatality rate of 62.5 per cent.

The outbreak continued, and cases of meningococcic meningitis appeared in Springfield and the surrounding community throughout the re-

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mainder of the year. Meningococcus antitoxin was made available in Springfield late in March, 1935, and it was decided to give this preparation a trial. Intraspinal injections of 20 to 30 c.c. of undiluted antitoxin were administered in almost every case, and 90 c.c. of antitoxin was administered by the intravenous route after dilution in twice the volume of 10% dextrose solution. The solution was permitted to flow by gravity at a very slow rate. A syringe containing adrenalin chloride solution (1-1000) was kept at the bedside for the purpose of immediate injection in case any untoward reactions took place. Since March 20, 1935, there have been 53 additional cases of meningococcic meningitis in the Springfield area, and most of these patients were treated with meningococcus antitoxin by the intraspinal and intravenous routes. In this group there was a total of fifteen deaths, which is a fatality rate of 28.3%. Table 2 shows an analysis of this series of cases by age groups.

TABLE 2. MENINGOCOCCIC MENINGITIS IN SPRINGFIELD 1935 AND 1936\*

Age Groups	Male	Fe-male	Total	Deaths With-		Case Fatality %
				in 48 Hrs.	Total Deaths	
Under 1 yr.....	2	1	3	1	3	100
1 to 4 .....	6	3	9	0	1	11.11
5 to 9 .....	6	4	10	1	1	10
10 to 14 .....	2	1	3	0	1	33.33
15 to 19 .....	3	1	4	0	0	0
20 to 29 .....	10	3	13	4	7	54
30 to 39 .....	3	2	5	0	0	0
40 to 49 .....	3	1	4	0	1	25
50 and over.....	1	1	2	1	1	50
Total .....	36	17	53	7	15	Av. 28.3

Repeated daily intravenous injections were carried out in most cases. As in all other diseases in which serum therapy is employed, the earlier the patient receives antitoxin, the greater are his chances of recovery. In our experience, we found that those receiving antitoxin within 48 hours of onset are much more likely to recover than those who are treated after a greater period of time has elapsed. From the results obtained here, we feel that the antitoxin is of great value and should be promptly used in treating persons with meningococcic meningitis. The fatality rate was lowered from 62.5% in the first 16 cases who were treated with antimeningococcus serum to 28.3% in the 53 cases who were treated with

meningococcus antitoxin. It should be remembered, however, that the first 16 persons received antimeningococcus serum by the intraspinal route only; accordingly the results obtained in these cases are not strictly comparable to the group that received meningococcus antitoxin by the intravenous route for the most part.

There were surprisingly few complications in this series of cases. There were no eye complications whatever. Two children had ear complications (deafness) when they were admitted to the hospital, and the ears did not improve following administration of antitoxin. None of the patients developed ear complications after antitoxin was administered. Occurrence of arthritis, which is the most common complication in meningococcic meningitis, in only one instance, is due in our opinion to administration of antitoxin by the intravenous route. This procedure apparently overcame the meningococcemia and prevented the development of secondary foci in the joints.

Before administration of any horse serum product, whether by the intraspinal, intramuscular or intravenous route, care should be taken to determine whether or not the patient is sensitive to horse serum protein. A small quantity of the serum should be diluted 1-10 with sterile physiologic salt solution, and 0.1 c.c. injected intracutaneously on the flexor surface of the forearm. If within fifteen minutes the injected area becomes hyperemic or swollen, the patient is sensitive to horse serum protein, and should be desensitized. Desensitization is carried out by fractional subcutaneous injections of the undiluted serum, beginning with an injection of 0.5 c.c. Subcutaneous injections should be repeated at 30 minute intervals by injecting twice the previous dose until the entire contents of one vial are injected. If the patient is markedly sensitive, the first dose should be 0.1 c.c., and subsequent doses should be doubled thereafter at 30 minute intervals. Following this procedure, intramuscular and intravenous injections may be made without danger. If one desires to be on the safe side before the antitoxin is given intravenously to any patient, irrespective of sensitivity, an intramuscular injection of one vial (30 c.c.) of the serum should be made four hours before the intravenous injection is contemplated. The gradual absorption of the antitoxin by the intramuscular route will serve to adequately de-

\*Analysis of records of 53 cases of meningococcic meningitis treated with meningococcus antitoxin in St. John's Contagious Disease Hospital, Springfield, Illinois, from March 20, 1935, to December 31, 1936.



sensitize the patient. If after one or more injections of meningococcus antitoxin, it is desired to give additional injections after a lapse of several days, the method of desensitization as outlined above should be followed for every patient. This procedure will eliminate reactions which might occur due to sensitization to the antitoxin previously administered. Asthmatics should not receive horse serum preparations unless it is absolutely necessary and, if given, every precaution should be observed to prevent serious reactions.

The majority of patients in this series developed serum sickness eight to twelve days following the first dose of antitoxin. This reaction was characterized by urticaria, edema and an elevation in temperature in some cases. Adrenalin chloride solution (1-1000) was administered to these persons in 0.5 c.c. and 1.0 c.c. doses once or twice daily. Calamine lotion and soda bicarbonate baths will also relieve irritation caused by the urticaria. This delayed reaction is not to be confused with the reaction which occurs in persons who are hypersensitive to horse serum; in such persons an immediate anaphylactic reaction takes place which is characterized by sudden extreme prostration and a rapid and weak pulse. These reactions can be avoided by determining sensitivity with the intracutaneous test, which should be followed by proper desensitization.

Meningococcus antitoxin is now distributed by most high grade pharmacies throughout the state, and the preparation is available in 30 c.c. vials, which contain 10,000 units of antitoxin. We regret that the Illinois Department of Public Health has no funds at its disposal for distributing this product without cost to meningitis patients. However, this preparation is considered to be of such value that every effort should be made by physicians to administer this therapeutic agent at the very earliest moment to all persons with meningococcic meningitis.

#### SUMMARY

Since January 1, 1935, 69 cases of meningococcic meningitis have been hospitalized in the St. John's Contagious Disease Hospital in Springfield.

The first 16 persons were treated with anti-meningococcus serum intraspinally, ten of whom succumbed, which is a fatality rate of 62.5%.

The 53 subsequent cases have been treated with meningococcus antitoxin by both the intravenous and intraspinal routes. Fifteen deaths occurred

in this group, which is a fatality rate of 28.3%.

In our experience, the decrease in the fatality rate in the group treated with meningococcus antitoxin justifies its use on a wide scale by the medical profession.

*Acknowledgment.* I wish to thank the Hospital Sisters of St. Francis, who conduct St. John's Hospital, and the physicians of Springfield for their cooperation in giving meningococcus antitoxin a trial in this series of cases.

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#### DISCUSSION

Dr. Thomas D. Masters, Springfield: The recent epidemic of meningococcic meningitis in this county, the methods of treatment and the results obtained have been described clearly by Dr. Tucker. There is little doubt that meningococcus antitoxin as employed here and as described by Dr. Hoyne in Chicago has been proved to be far more effective than the serum.

It must be borne in mind that with the mild epidemic throughout the country in 1935 there was a striking similarity in its manifestations everywhere. Different strains of meningococcus may produce an epidemic at another time or sporadic cases not so responsive to the present antitoxin. Furthermore, the fatality rate in Sangamon county was shown to be relatively high in the last nine or ten patients in whom the disease was acute and fulminating. This may not be considered an indictment of the antitoxin. Perhaps much larger doses would have prevented some of these deaths.

Here, as elsewhere, two well defined types of onset were seen. First, those having a mild upper respiratory infection for several days to two weeks prior to the appearance of meningeal involvement. Second those in whom the evident onset was sudden and explosive with symptoms directly and immediately referable to meningeal involvement. In this latter group the fatality rate was higher.

The contagiousness of the disease was demonstrated by the fact that the early cases were traced to a Federal Transient Bureau shelter. It was also shown by the appearance of the disease in two children in each of two families. The advantage of early treatment was emphasized in these children. In both instances the first child to develop the disease died, whereas the second child receiving earlier diagnosis and prompt treatment recovered.

The complications that did arise in this series of cases, while not numerous, were interesting and include arthritis, destruction of the eighth nerve, conjunc-

titivitis, and probably epididymitis. The recognition of the meningococcemia and the direction of therapy toward this stage by adequate intravenous antitoxin appears to be a logical advance in the treatment of meningococci meningitis.

Dr. Archibald L. Hoyne, Chicago: When we consider the prevailing fatality rate for this disease, I think we must conclude that Dr. Tucker secured some very excellent results.

In regard to the average fatality rates for the years 1933, 1934 and 1935 in this state, I think in those years Chicago probably had most of the cases. It was in 1933 that we began to change our method of treatment; consequently we have been inclined to believe that the lowered fatality rate in Chicago for the years mentioned was due to some extent to the improved method of treating the patients that came into our hospitals. Among most of the patients entering the two contagious disease hospitals, age was undoubtedly a very important factor. We have found that over the age of twenty years the fatality rate mounts very rapidly. For 201 antitoxin treated patients of all ages that we had at the County Hospital, there was a fatality rate of 27.3%. Those patients were all treated both intravenously and intraspinally. Now, I think that it is not merely the remedy used for this disease, but the method by which it is applied that is of great importance. Since January 1 we have given no antitoxin or antimeningococcic serum intraspinally. All treatment is given intravenously. From the first of the year we have had in the two hospitals more than 100 cases treated in this way with a fatality rate of less than 16%. At the County Hospital, with 43 patients who were twenty years of age and less, our fatality rate was less than 3%.

We have found that by giving large doses of serum or antitoxin intravenously, we get negative cultures from the spinal fluid very much earlier than when the serum or antitoxin is given intraspinally. The organisms seem to disappear much more quickly, notwithstanding the fact that for twenty-five or thirty years the general claim has been that the serum must be introduced into the spinal canal in order to bring it in contact with the organisms; that they cannot be destroyed in any other way. Nevertheless, with the intravenous method complications are fewer and patients recover sooner.

For 79 recovered cases the average number of hospital days was 14.1. We have difficulty sometimes now in holding the patient until the quarantine period has elapsed. After four or five days we occasionally have a patient ask how much longer he has "to lie around the hospital." This story seems rather startling and perhaps hard to believe unless you have had an opportunity to witness some of these remarkable recoveries.

Dr. Tucker, if I recall correctly, gave an average of 85,000 units per patient. Now, we have very few patients to whom we give less than 100,000 units. Some of the patients receive three or four hundred thousand units. We recently had a woman who had

been ill six days when she entered the hospital in coma; she received 100,000 units every day for four days. About the fifth or sixth day she was reading a newspaper, waiting for the quarantine period to elapse. Similar recoveries have been frequent. So we think the method of treating the patient without any intraspinal therapy is much superior to both intravenous and intraspinal.

Any of the standard sera, if given in sufficiently large doses, is likely to bring about very good results if given intravenously. It seems to me that one of the outstanding differences is that among the antitoxin treated cases we have not had a patient who had suffered loss of vision or loss of hearing after treatment was commenced; and that is not true in regard to the patients treated with serum. In addition, the antitoxin cases usually seem to respond more rapidly to treatment. I think those two things alone are sufficient to make you consider whether or not you would rather give antitoxin than serum, although we have had a great many good recoveries with serum. We have given some children as much as 300 c.c. of antimeningococcic serum in one dose intravenously, diluted in 10% glucose, to which five to ten minims of adrenalin was added; and that is all the serum treatment the patient received and recovery was prompt.

Dr. Tucker, in closing: I was very much interested to learn that Dr. Hoyne has employed as much as 200,000 units of antitoxin in treating a single patient within a 24 hour period. The largest amount of antitoxin injected in this series of cases in any 24 hour period was 70,000 units, viz., 10,000 units intraspinally, 30,000 units intravenously early in the morning, and 30,000 units intravenously during the evening of the same day. However, this procedure has been followed for several days in some instances, and therefore the total amount injected was about the same as that employed by Dr. Hoyne. As you know, when serum therapy is employed in treating any acute disorder, the sooner the case is diagnosed, the sooner the patient receives serum therapy and the chances for recovery are greatly enhanced.

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## ACUTE APPENDICITIS

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The unusual and prolonged complications of acute appendicitis are frequently found in reports on this disease as illustrated by a report of a case by McKechnie<sup>1</sup>. Perusal of the literature shows that in a large number of deaths in a certain group of population, appendicitis rated second only to cancer among surgical diseases.

*Mortality Rate.* The death rate for appendicitis in the United States in 1930 was 17 plus per 100,000 or a total of 17,687. The number



of deaths attributed to appendicitis in the State of Illinois<sup>2</sup> in 1929 was 1298, or a death rate of 17.4 per 100,000 population.

As shown in Table I, the average operative mortality in acute appendicitis is about 5% in the various clinics of the country where thousands of cases are handled.

TABLE I. MORTALITY IN ACUTE APPENDICITIS IN THE VARIOUS CLINICS:

Author	Clinic	Cases	Deaths	Mortality %
Hunter, John B. <sup>3</sup>	London Hospital.....	602	21	3.5
Wilensky, H. O. <sup>4</sup>	Collected .....	1765	86	4.9
Colp, R. <sup>5</sup>	.....	2841	148	5.2
Eliason, R. L., <sup>6</sup> and Ferguson, L. K. <sup>6</sup>	Leads General Infirmary .....	1080	62	5.7
Bower, J. O. <sup>7</sup>	Collected from 27 Philadelphia Hosps.	5121	306	5.7
McClure, R. O. <sup>8</sup>	Ford Hospital .....	940	61	6.5

The mortality rate in my own community as reported in 955 collected cases of non-perforated acute appendicitis is about 2%. Needless to say I am unable to talk in terms of thousands of cases, nor am I able to discuss from my own experience other than non-perforated acute appendicitis; all I can put forth is the experience of "Half a Medical Life" (fifteen years 1921 to 1936) of private practice pertaining to acute non-perforated appendicitis as I never had a perforated one in my white private practice, referred or otherwise.

As illustrative of my experience ten cases of acute non-perforated appendicitis are charted. All cases were from the local community of Evanston, Illinois, and operated upon in the two local hospitals by myself, and varified post-operatively by the pathologist as acute appendicitis. *Factors Influencing the Mortality Rate.* 1. The local and associated pathology is a decidedly influencing factor on the mortality rate. In one large group of cases the earliest perforation was four hours from the onset of symptoms.

2. The time element (delay) before operation has a decided influence on the mortality rate.

3. Laxatives and the mortality rate are closely interrelated especially so depending on the state of pathology in the appendix.

4. The use of morphine is a great cause of delay and mistaken diagnosis and thus influences the mortality rate in acute appendicitis cases.

5. Often cited as a factor is the tremendous increase in the number of the occasional operator.

To me the salient feature in cases of acute

appendicitis is the fact that the younger ages pay the toll, and measuring the practice of medicine as it should be measured by years of life lost, it is most often in acute appendicitis cases that twenty to forty years of life are lost as compared to the inoperable or operable cancer cases where three to ten years of life at the most are lost.

Krasnoselskiy<sup>10</sup> studied 1944 cases of acute appendicitis from the viewpoint of the local and associated pathology and its influence on the mortality rate, and arrived at the conclusion it was this factor and not the time element (delay) that was the deciding factor in the mortality rate. This I believe to be true, therefore it behooves one to stop the pathological process as soon as possible (i. e.) operation.

Every adult individual in an intelligent community should know that the time element (delay) before operation has an important influence on the mortality rate in case of acute appendicitis, but my experience has been that no general rule can be formulated as to the length of this time element. What is a safe element of time before operation for one individual with an acutely inflamed appendix may be and is most likely to be unsafe for the next individual.

I have allowed a case of acute appendicitis to develop under my care for thirty-six hours to find the distal tip of the appendix inflamed at operation, only to rush the next one to the hospital and worry for fear I was not operating soon enough with an eight hour elapse of time from the onset of the symptoms.

There is no doubt that laxatives administered at the time of undiagnosed abdominal pain play an important part in the mortality rate of acute appendicitis cases. Far better would it be for everyone to give nothing by mouth in the presence of undiagnosed abdominal pain. My own experience has been that the laxative made the illness more alarming and therefore the diagnosis and treatment easier and did not particularly influence my mortality rate.

Morphine and its influence on the mortality rate in case of acute appendicitis should be qualified as to when the morphine is used: before diagnosis, NO, after diagnosis I can see nothing but good from its use.

In regard to the factor of the occasional operator let me quote "Boland." "It is better to have an early operation performed by a general prac-

tioner than a late operation performed by a professor."

Number of Cases: 10.

Preoperative Diagnosis: All cases acute appendicitis.

Postoperative Diagnosis by the Pathologist:

1. Acute catarrhal appendicitis. Acute fibrinopurulent peri-appendicitis. Chronic interstitial appendicitis.

2. Acute hemorrhagic appendicitis.

3. Acute gangrenous appendicitis. The appendix is everywhere necrotic.

4. Acute catarrhal appendicitis.

5. Acute gangrenous obstructive appendicitis.

6. Acute fibrinopurulent, hemorrhagic and gangrenous appendicitis.

7. Chronic obliterative appendicitis with acute fibrinopurulent exacerbation.

8. Acute gangrenous obstructive appendicitis.

9. Acute suppurative appendicitis of tip of the appendix.

10. Acute diffuse appendicitis.

Where Operated on: St. Francis Hospital and Evanston Hospital, Evanston, Illinois.

Who Operated: Writer.

Age of the Patient: Oldest, 75 years. Youngest, 11 years. Average age 28.6 years.

Time Element (Delay): From onset of symptoms to operation: Longest, 61 hours. Shortest, 5 hours. Average 25.4 hours.

Hospitalization: Longest, 19 days. Shortest, 9 days. Average 12.6 days.

White Blood Count:

Preoperative: High, 28,200. Low, 3600, 4100, 4500, (three counts in one patient 75 years old.)

Cathartics administered preoperatively and before diagnosis:

Number of Cases: 2. One case two doses, p. m. and a. m.

Morphine administered before diagnosis:

Number of Cases: None.

Type of Operation: Incision: Right rectus muscle splitting extending above and below the navel.

Salient Points: Inversion of the stump of the appendix. The stump was inverted in nine cases by a Runyon stitch. In one case it was ligated only.

Drainage: Was instituted in two cases with rubber tube drains because of free fluid in the peritoneal cavity, in one case the pathologist's diagnosis was acute appendicitis with peri-appendicitis.

Perforations: None.

Complications: None.

Mortality Rate: None.

#### SUMMARY

Ten cases of acute appendicitis verified by the pathologist's diagnosis are charted illustrative of the experiences of "Half a Medical Life" (fifteen years) of private practice in this disease in a white intelligent community. The chart is self explanatory.

One case of acute appendicitis successfully

terminated will go a long way towards combating all the furor about the high cost of medical care, and the constant increasing talk in favor of state medicine and other cracked pot ideas.

In the experiences of Half a Medical Life (fifteen years) in handling cases of acute appendicitis I have never had a perforation, complication, or a death. Where I am sure I have nothing to boast of, neither have I anything of which I am ashamed.

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#### THE TREATMENT OF PETROSITIS

With Report of Three Cases

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CHICAGO

The treatment of petrous suppuration is admittedly surgical. The manner of approach and the type of surgery to employ must vary somewhat with the nature of the lesion. Whatever method is undertaken it is assumed that it must be adequate in eradicating the suppurating focus and prevent extension of the disease to the meninges with a possible fatal outcome. Various techniques have been advocated. Voss<sup>1</sup> believed that in addition to the performance of the mastoid exenteration, a wide exposure of the epi-tympanum would be sufficient to drain the petrosa. Undoubtedly the exposure of a fistula without enlarging its opening will but rarely cause it to drain satisfactorily. Many cases in which no apparent fistula can be observed have been described and such cases, of course, require further surgery. This type of surgery (Voss) is certainly far from convincing one as to its adequacy in the various types of purulent retention in the petrous. Freckner<sup>2</sup> enters the petrous tip through the arch of the superior semicircular

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canal, removing the cancellous tissue between the horizontal and superior canals with a specially constructed curette, outlining the arch and following the cells beneath the arch, forward and inward until the tip is entered. If a fistula is present at the time of operation it would seem wiser to utilize this tract established by nature to drain the tip, by widening and enlarging it. Even when confronted by a closed empyema of the tip, this procedure may be found wanting as the presence of a tract of cells beneath the arch is not constant and one may have extreme difficulty in producing a tract through the dense bone. Ramadier, Guillon and Becker<sup>3</sup> describe a rather formidable procedure which they developed on the cadaver. The technique entails an extensive wide radical mastoid operation, removing the anterior bony wall as well as the floor, exposing the glenoid fossa and the anterior wall of the middle ear, which is removed below the opening of the eustachian tube, thus exposing the carotid artery which is pulled out of its canal by means of a ligature enabling the operator to enter the petrous tip through the inner wall of the carotid canal. Such a radical procedure is open to serious question. The mandibular joint may have interference with its function as a result of the operation. Post-operative drainage from the tip may be impeded by the carotid artery, falling back into place at the termination of the procedure and the technique may also open other pathways of septic soilage of the meninges via the perivascular spaces. In the presence of an obvious fistula one can hardly see the need of such an extensive and radical procedure, fraught with such possibilities just mentioned. Eagleton<sup>4</sup> skeletonizes the posterior aspect of the petrous bone by the removal of the sinus plate, the tegmen, the bone over Trautmann's triangle and then removes the root and some of the zygoma, the squama and some of the anterior canal wall, thus skeletonizing the anterior portion of the petrosa. The tegmen is then completely removed and the dura elevated bringing the petrous tip into view, which is entered by removing the bone overlying the apex. Kopetsky and Almour<sup>5</sup> developed a logical technical approach that is especially indicated for drainage of an empyema of the top in a pneumatized petrous pyramid, in which no demonstrable fistula is evident. Following a radical mastoid operation the tensor tympani muscle is

removed and the orifice of the eustachian tube identified. Then, by means of a drill, a tract is made by placing the burr point in the roof of the mouth of the eustachian tube and burring inward and forward at an angle of 22 degrees to the external canal. This technique in forming a tract along the peritubal cells gives adequate, dependent drainage to the tip. Further, it seems to follow the path that has been so frequently described in many cases in which a spontaneous fistula had been affected by nature. It is obvious that any of these techniques may not be necessary as a rule in cases in which at the time of operation a fistula has been found, either in the epitympanum or in the middle ear. In such instances probably all that is necessary is the widening and curettement of the established tract so as to afford efficient drainage. Lille<sup>6</sup> has reported two such cases in which cures were effected by widening and curettement of a fistula that appeared in the epitympanum, and Seydell<sup>7</sup> reports similar success in the use of this procedure.

Myerson, Rubin and Gilbert<sup>8</sup> advocate entry into the anterior wall of the petrous tip by means of a special gouge, after the performance of a thorough simple mastoid operation. They claim that their procedure effects a thorough evacuation of the petrous tip with preservation of the patient's hearing. In another contribution<sup>9</sup> on the subject they point out the frequent bottleneck arrangement of the fistula which they believe would at times preclude efficient drainage and therefore advocate uncapping of the anterior wall of the pyramid.

A review of the recorded cases makes it obvious that no one of the procedures described is equally applicable in all cases. It would appear logical to perform first an extensive and thorough simple mastoid operation and then search for the presence of a fistula at the sites of predilection; either anterior or posterior to the superior semicircular canal, either within or above the arch of the superior semicircular canal, and either below or posterior to the posterior canal. If a fistula be found at any of the sites it might be widened and enlarged and the patient carefully observed. If the postoperative progress was unsatisfactory, then the petrosa might be entered and the tip uncapped. If, however, no fistula is found the simple mastoid cavity might be converted into a radical mastoid cavity and the

search made for a fistula either at the eustachian tube orifice or just above it. A fistula found in this region is treated by enlarging and widening its tract and careful postoperative observation will decide as to the adequacy. If no fistula is found at this time, then recourse to a more radical procedure is necessary. Here one may have his choice of those suggested by Almour, Eagleton, or Myerson and his associates.

The exact indication for surgical intervention on the petrous pyramid has not, as yet, been definitely determined and a great deal of confusion still exists.

Certainly not all cases of petrosal involvement require surgery. It is conceivable that the petrous tip may be but mildly involved in the pathologic process and it has probably been the experience of most otologists that many of their cases of mastoiditis with pain in and about the eye have gotten well without a petrous operation. In fact, Myerson<sup>8</sup> states that about 80% may recover with conservative management. Yet the potential complications of meningitis, brain abscess, cavernous sinus thrombosis and general sepsis are of such a grave and frequently fatal nature as to make us profoundly conscious of our responsibility when confronted by a case of petrosal infection. While no hard and fast rule may be drawn; conservative management seems to be indicated only in those cases in which the pain is mild and decreasing in intensity; in which the temperature is normal, or slightly elevated; in which the discharge has not abruptly ceased; and in which the x-ray findings show either a normal or slightly involved petrous tip. On the other hand—pain increasing in intensity, especially if it be nocturnal and interfere with sleep, an increasing temperature, a sudden cessation of the discharge, positive x-ray findings, and signs of sepsis or meningeal irritation—all point to an immediate evacuation of the petrous tip, as a means of preventing further progression of the purulent process towards the cranial cavity with the possible production of a fatal complication. The danger lies, not in the operation, but in the delay during which meningitis, brain abscess or cavernous thrombosis may supervene.

Our short series of three cases follow:

*Case 1.* B. K., aged 7 years, was seen on May 22, 1935, complaining of pain in the ear associated with a profuse otorrhea. Some six weeks prior to his visit he had been afflicted with an acute pain in the ear, which was incised by his family physician. The ear

had run ever since. The child had been continuously ill and more or less headache was present all the time. Examination of the nose showed a receding rhinitis. Teeth, tonsils and pharynx were negative. The right ear showed a profuse discharge and the drum was deeply red in color. There was a definite sagging of the posterior bony canal wall. There was no tenderness behind the ear. The left ear showed a normal reflex. Functional examination showed the right ear could hear the whispered voice at contact, while the left ear heard the whispered voice across the room. The Weber lateralized to the right. The x-ray examination revealed a complete obliteration of the cell structures on the right mastoid while the left was normal. A simple mastoid was advised, accepted by the family, and performed. During the operation it was noted that the boy's mastoid was very large and extensively pneumatized. The intercellular structures were practically all destroyed and the entire mastoid terrain was an empyema. A very thorough exenteration of all the cells was performed and the patient returned to bed in good condition. The temperature subsided the following day and he was discharged from the hospital in five days. One week later, or twelve days following the mastoid operation, the patient complained of pain in the right eye. By this time the middle ear had become dry. Two days later a recurrence of the profuse otorrhea was noted, not only in the canal but also in the post auricular wound. At this time a right abducent paralysis was noted and the patient complained of diplopia. A diagnosis of petrositis was made and it was suggested that he be rehospitalized for observation and possible intervention. A member of the family insisted upon otologic consultation and the consulting physician advised conservative measures, merely observation. The family refused to admit the patient to the hospital. The course continued as before. Severe pain in the eye was associated with a temperature ranging from 100 to 101 degrees. The blood count was 27,000 and x-ray showed a definite breaking down of the petrous tip. The child was seen daily and his condition did not materially improve. Suddenly, five days after the diagnosis of petrositis was made, a telephone call was received stating that the temperature had gone to 103 degrees and the child was irrational. He was immediately admitted to the hospital in a semi-stuporous condition. There was marked stiffness of the neck with associated signs of meningitis. Immediate operation was advised and was concurred in by Dr. Salinger, who saw the patient in consultation. It was admitted, however, that a frank purulent meningitis was present and that the outlook was gloomy. Under general anesthesia the mastoid terrain was revised. A thorough search was made for fistulae, but none was found. The simple mastoid cavity was then converted into a radical mastoid cavity and the mouth of the eustachian tube identified. A small drill burr was placed 2 m.m. above and behind the opening of the eustachian tube at an angle of  $22\frac{1}{2}$  degrees to the external canal. Upon burring for one or two m.m., the drill suddenly fell into a cavity from which thick creamy pus exuded. The small drill



hole was enlarged with a curette and about one-half teaspoon of pus removed. The abscessed cavity in the petrosa was carefully palpated with the back of the curette and the carotid was found anteriorly. A loose packing was applied to the wound and the patient returned to bed. He did not regain consciousness and expired two days later from his meningitis.

Had a petrous operation been performed at the time of diagnosis, undoubtedly we would have a living patient today.

*Case 2.* R. L., female, aged 19 years, had a severe cold during Christmas week in 1935. Two weeks later she was seized with dizziness associated with vomiting and some headache; there was also present a deep pain in the left side of the head. Examination of nose and throat was negative. Both ear drums were fairly normal, however, a nystagmus with a quick component to the right was present. She was observed for a period of two days and reexamination disclosed a slight blush in the left ear. The ear was incised with immediate relief of the deep pain and an immediate cessation of dizziness and nystagmus. However, no pus was obtained upon incision, nor did any develop later. She remained well for a period of ten days when suddenly a deep pain in the left side of the head occurred with the return of dizziness and nystagmus. Examination showed that the previous paracentesis had healed and the ear was reopened. Four days later she became irritable and complained of headaches. X-ray pictures of both mastoids showed a clear cellular structure. However, a petrous plate showed a definite involvement of the petrous tip. Her temperature had gone to 101 degrees. Consultation with a neurologist was advised. Dr. Krumholtz concurred in the opinion that a definite meningeal irritation was present and believed that operation should be performed. Spinal fluid was to be under pressure and only 112 cells; lymphocytes were present. The culture and smear were negative. A radical mastoid operation was performed and an extensive bleeding, hemorrhagic mastoiditis was uncovered after removing the cortex. There was a definite pari-antral destruction of the cells and a mucoid tension in the antral region. The lateral sinus was exposed and found to be normal. A thorough search for fistulae was negative. The simple cavity was converted into a radical and a thorough search for fistulae in the middle ear was made. None could be found. It was thought that we were possibly dealing with a labyrinthine irritation and that the extensive exposure would be sufficient to treat the condition. Operation was discontinued at this point. Upon recovery from the anesthetic the patient still complained of headache. She became more irritable. Definite stiffness of the neck developed. Consultation with another neurologist was obtained. He advised no further interference and believed that the meningitis syphatica would get well. The following day, however, the patient became stuporous. There were involuntary spasms of the arms and legs. Spinal puncture revealed fluid under tremendous pressure and cloudy. Cell count had increased to 3100. Immediate petrosal operation was advised and accepted. Under gas ether anesthesia a radical mastoid terrain

was searched for fistulae but none was found. The squama was removed, as well as the tegmen over the middle ear and mastoid. The dura appeared normal throughout. The dura and brain were retracted and a definite necrosis, of the superior portion of the petrosa was found. The necrotic bone was easily removed with the curette but no free pus was encountered. The necrotic petrosa extended from the tip laterally to the eminence formed by the labyrinth. From this portion laterally to the middle ear and mastoid the petrosa was hard. Rubber dam drain was inserted and a light packing placed in the operative terrain. The patient was returned to bed. Her stupor continued and the following day both tonic and clonic convulsions were noted. The temperature rose to 105 degrees; spinal fluid showed 3225 cells and the patient expired the following day.

This undoubtedly was a case of osteomyelitis of the petrosa, secondary to probably an acute sphenoiditis. The middle ear labyrinth and mastoid findings probably being due to an extension of the inflammation from the sphenoid to petrosal structures.

*Case 3.* R. D., aged 7 years, was seen on April 11, 1936, with the complaint of pain in the right ear associated with discharge, which had been present for four weeks. Examination of the nose and throat was negative. The right ear revealed a profuse discharge in the canal associated with a sagging of the posterior canal wall. There was marked tenderness over the mastoid tip and antrum. The hearing was whispered voice at contact. The left ear was negative. Examination of the x-ray showed a marked breaking down of the right mastoid. Mastoid operation was advised and performed. At operation an extensively broken down mastoid was uncovered. The patient returned to bed in good condition. The post-operative course was good except that his hearing did not come back and the deafness persisted in spite of the fact that the middle ear was dry within a period of three days. Seven days after the operation despite the fact that he had been running a temperature of 100 to 101 degrees, he was permitted to go home upon the insistence of his family. Four days later, or 11 days after operation, the child complained of headaches associated with vomiting. Examination at this time disclosed a marked course nystagmus to the left. Temperature, however, was normal. There was no discharge from the canal. It was advised that he be readmitted to the hospital and petrous plates taken, which showed involvement of the tip. Careful observation was decided upon. There was no change in his condition for three days, during which time the temperature was normal and there was occasional vomiting but no meningo-irritative phenomena. However, on the fourth day following admission to the hospital, the child suddenly complained of severe headaches associated with diplopia and vomiting. Examination disclosed a stiff neck. The child was irrational and the temperature suddenly ran up to 103 degrees. Consultation was requested and by the time the consultant arrived, an hour or so later, a definite Kernig, Babinski, and other irritative signs of meningitis were present. The spinal fluid was under tension, ground

glass in color, and showed a cell count of 8000. No organisms were found on the smear. A petrosal operation was advised and concurred in by the consultant, Dr. Lewy. Under light ether anesthesia a simple mastoid cavity was converted into a radical one—the anterior buttress was removed. The entire petrosa was skeletonized by the removal of the temporal squama, the tegmen, the bone over Trautmann's triangle, the bone over the lateral sinus and over the cerebellum. A careful search for fistulae was negative. The dura was elevated over the petrosa and an attempt was made to get into the petrosa with a curette without success. The bone felt hard. With an elevator the basilar cisternae were opened with a discharge of blood and cerebrospinal fluid. In addition it was decided to enter the petrosa by the Almour technique, which was performed. A cavity was entered but only free bleeding encountered and no pus was obtained. A light packing was applied to the wound and the child sent back to bed in good condition.

The first postoperative night was stormy, but the following day the temperature had dropped to 100 degrees by rectum. Sensorium had cleared—all the meningo-irritative phenomena, Kernig, Babinski, etc., had disappeared and there remained but a slight stiffness of the neck. Nystagmus was faintly susceptible; diplopia, however, was still present. The spinal fluid was under less pressure, although still cloudy, and but 2000 cell count. The following day, the third after operation, the temperature was normal, the child's condition was excellent, the sensorium had cleared. All phenomena were absent. The diplopia had disappeared, there was no nystagmus and all stiffness of the neck and associated meningo-irritative signs were absent. He was now eating and sleeping and apparently progressing well.

Here we have a child who was operated upon within four hours after the onset of the acute signs of meningeal involvement. Whether the satisfactory response was due to the Eagleton skeletonizing of the petrosa, the Lewy method of evacuating the basal cisternae, or the Kopetsky-Almour intervention into the petrosa must, of course, remain in question.

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#### DISCUSSION

DR. STUART BROADWELL, Springfield: I think a discussion of this subject is very interesting, because so

many of these symptoms go along and we really do not appreciate what the condition is. It has been only in the last two or three years we realized how important it is. I wish to speak of a case with practically no symptoms other than facial paralysis. A girl 28 years of age, a school teacher, had scarlet fever in December, 1934, mild. She recovered, with some complication in the left ear. She was all right for six months, and in May developed a vertigo. There was a retracted drum in the right ear; with inflation this cleared up. Facial paralysis developed two weeks following. She had this for six weeks. X-ray of the mastoid, white blood count, were negative. This cleared up, and two weeks following she developed symptoms on the opposite side. I suggested that she see Dr. Sachs; he thought the thing would clear up and gave some treatment with diathermy and x-ray, and it did improve some. In December, just a year from the time she had scarlet fever, she developed pain in the head, convulsions and died within forty-eight hours. Autopsy showed all over the pyramid an area about the size of a dime which had broken through and she developed a brain abscess in this area. She must have had the facial paralysis when it broke through. She developed immunity, the white blood count was never over 11,000, the canal was red-dened and the drum was normal. The second paralysis came when she got a localized subdural abscess which subsequently caused meningitis from which she died. She never complained of pain, there was no diplopia, no discharge. And it occurred six months after scarlet fever, in the opposite ear from that in which she had trouble. Therefore, symptoms may be misinterpreted, and how to interpret them correctly we cannot tell. I think discussion of this thing is very important because every mastoid or ear case we see may be a potential petrositis.

DR. THOMAS C. GALLOWAY, Evanston: This is an excellent presentation. There are two things to remember. In the first place, when you have a stationary period and a clearing up of symptoms it may mean breaking through the petrosa, the relief of pressure and symptoms temporarily but it may also be a period of extreme danger. When one gets in addition, signs of meningeal visitation, the indications are for radical interference. Up to that point I think it is a mistake to advocate more radical procedure than the opening of performed tracts.

As to the Almour technic, there is a good deal of danger if you use a drill. I did the operation using a fine curette. It was tedious, but I felt it was safer. Even then the operation may not give adequate drainage and may need to be combined with Myerson's or other method.

DR. JOSEPH C. BECK, Chicago (Closing): This technique of reaching the petrous tip by way of the cranial cavity such as recommended by Eagleton, Myerson, Friesner and others is an excellent method, especially when one has good radiologic findings and particularly by the Taylor technique. In answer to Dr. Broadwell, I would say that one must consider each case by itself carefully. One cannot generalize. We



have for a long time recognized the Gradenigo syndrome without any suppuration from an osteomyelitic process being present at the tip of the petrous. Many of these cases, of course, get well spontaneously. Don't forget, however, that a good many develop meningitis and die that might have been saved by a petrous operation. The opening of the sub-arachnoid space in the case of my patient undoubtedly had a great deal to do with his recovery. Whether he is permanently cured or not is really the question. Only time will tell—thus far he is in excellent condition.

## ROLE OF EMOTIONS IN GASTRODUODENAL ULCERS

SAMUEL C. ROBINSON, M. D.

CHICAGO

With increasing frequency we are having brought to our attention the role of emotions in everyday disease. Dunbar<sup>1</sup> has collected 2,251 references from 1910 to 1933 that deal with emotions and bodily changes. Since 1933 the literature has been even more replete with similar articles. A large percentage of these call attention to the role of emotional disturbance in gastrointestinal disease. Nearly every practitioner is familiar with such cases and recognizes the causal relationships. Often patients themselves will volunteer the information that an emotional upset at work or at home may initiate cramp-like pains, gas, fullness and eructation, or one of many other dyspeptic symptoms. These disturbances of the motor, secretory, or digestive functions of the gastrointestinal tract disappear when the mind is again at rest.

In the last few years there has been increasing evidence brought forward in support of the theory that the emotional factor has a direct causal relationship to gastroduodenal ulcer, but in spite of this, hyperacidity still remains the most widely and generally accepted theory of the cause of this disease. Consequently, the prevalent therapy consists of acid neutralization—a treatment essentially unaltered since the sixteenth century.

It is difficult for the average practitioner to contemplate a different etiological factor when the theory of hyperacidity remains so deeply entrenched in the teachings and practice of the medical schools and hospitals. For this reason this paper will aim first to present the facts that prove the hyperacidity theory fallacious.

## THE CASE AGAINST HYPERACIDITY AS A CAUSE OF GASTRODUODENAL ULCER

1. It is interesting to note that most gastroduodenal ulcers do not occur in an acid medium. It is variously estimated that from 80% to 90% of all gastroduodenal ulcers are in the duodenum, where the medium is essentially alkaline. It is well to point out that the medium is alkaline promptly after secreted by Brunner's glands, and in all probability remains so even during digestion, when changes in its Ph value are not significant. At least this seems the conclusion to be drawn from the work of Katsch,<sup>2</sup> who contends that the neutralization of hydrochloric acid in the stomach is not accomplished by the regurgitation of the duodenal contents as had been previously taught. It is therefore scientifically accurate, in the light of our present knowledge, to state that nine out of ten ulcers have their origin, reach maturity, and disappear in an alkaline medium.

2. Many normal persons show a high concentration and an increased volume of hydrochloric acid who do not have an ulcer nor present any dyspeptic symptoms. The finding is often an accidental one, and this may be demonstrated in any age group. Alvarez<sup>3</sup> states that "one has only to see a few cases of elderly men with a free acidity around eighty units and no sign of ulcer, to realize that other factors beside acidity often enter in before an ulcer can be formed or maintained in a chronic state."

3. If hyperacidity and pepsin can produce an ulcer, why is approximately 80% of the mucous membrane of the stomach immune to ulceration even in the susceptible individual? Ninety-five per cent. of the benign chronic ulcers of the stomach are found in a narrow strip of the lesser curvature near the incisura. (Fig. 1.) An ulcer seldom develops in the large posterior portion of the stomach, the fundus, or in most of the cardiac region. This is made doubly significant when one considers the fact that most of the acid secreting cells are found in the fundus of the stomach, where the chronic ulcer seldom, if ever, occurs, and that the fewest parietal cells are found along the lesser curvature, where most of the ulcers do occur.<sup>4</sup> This one fact alone, which is attested to alike by radiologist, internist and pathologist, should be sufficient evidence to discredit completely the hyperacidity theory. It does not matter what explanation is offered for this unique

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site selectivity nor what other theory may be held; the hyperacidity theory is untenable in the face of this one fact alone.

4. Nearly every *gastric ulcer heals* in an acid medium. If acidity were the causative factor it would be logical to expect that the healing of the ulcer would take place after the acidity was reduced. This is absolutely untrue. Emery,<sup>6</sup> after an analysis of 1,435 cases, states: "We believed formerly that a high acidity was a definite complication to treatment. However, we have



Fig. 1. Site of gastroduodenal ulcers. (After Holmes and Hampton.)

been unable to determine any difference in the percentage of satisfactory results in patients with low, moderate and high acidity. Incidence of complications was the same, irrespective of the amount of acidity."

Still further confirmation that healing proceeds in spite of volume or concentration of hydrochloric acid is found in the recent use of new therapeutic agents. When mucin,<sup>6,7</sup> okra,<sup>41</sup> non-specific foreign protein,<sup>8</sup> or histidin<sup>9</sup> are used as the only therapeutic agents, cures occur with acid curves remaining about the same before during and promptly after the cure. Even more convincing is the fact that most ulcers will heal spontaneously without any neutralization treatment or without any treatment whatsoever.<sup>7</sup> Of course the hyperacidity is unchanged in these patients. The presence at autopsy of scars in the stomach and duodenum in patients with no past ulcer history is further evidence. Even when the Sippy therapy is used, continuous neutralization is not achieved. Winkelstein<sup>10</sup> has shown in 75% of the cases studied that "the free

acid was not neutralized throughout the night by the combined effect of aspiration, neutralization and inhibition." And it would be a hazardous guess to assume that any therapy yields 100% neutralization throughout the day. After the "cure" of many ulcer patients, we often find their acid curves higher than average, yet they are symptom free. Years ago Moynihan<sup>11</sup> said, "Why is it that the gastric cell, born, reared and developed in an acid medium, should all of a sudden be afraid of an acid?"

5. Cases of incipient ulcer throw further light upon the fallacy of the hyperacidity theory. Often patients present themselves with the complete symptomatology of gastroduodenal ulcer, but with no x-ray evidence of the ulcer. Many of these patients have been operated upon and no ulcer was found. But their hyperacidity curves are identical with those of a typical ulcer patient.<sup>12</sup> We, therefore, have a patient with all symptoms and signs of gastroduodenal ulcer, including hyperacidity, and a normal mucous membrane in his stomach and duodenum. We then must conclude that the hyperacidity is unable to erode the stomach wall along the lesser curvature and duodenum in patients not only susceptible but actually suffering with the ulcer syndrome. As shown elsewhere<sup>13</sup> the pathology is in the wall of the stomach and duodenum, and has not as yet extended to the mucous membrane. The pathology progresses independently and in spite of the acid-pepsin factor.

6. The physiologist has consistently failed to produce a chronic ulcer in the stomach or duodenum of a normal experimental animal with undisturbed viscera, by injecting toxins, bacteria, acids, or by the use of coarse foods. If a portion of the mucous membrane and muscularis of the stomach is removed, the wound will heal promptly even if hydrochloric acid is added in a concentration greater than can be secreted by the animal, namely 0.7%.<sup>14,15</sup>

Human stomachs will heal defects very rapidly of course in the presence of hydrochloric acid. These defects have been made surgically, by bullets and by trauma, but in each instance mucosa bridges the gap, and no ulcer develops. Hildreth<sup>16</sup> cites a case in which "the following objects were removed from the stomach: 48 teaspoons, one teaspoon handle, three balls, one nut, one prune pit, one button, one small piece of glass, two pieces of spring wire, one



needle, one piece of cinder, one hair pin, one lead pencil. . . . Recovery from the operation was uneventful except for a slight infection of subcutaneous tissue."

Why is it that, in spite of this mass of evidence which seems to the author incontrovertible, we continue to worship at the altar of hyperacidity? Smithies was foremost among American men to decry the emphasis on hyperacidity. In 1920 he said:<sup>17</sup> "About ten years ago I became convinced that any treatment of 'peptic ulcer' based on fluctuating gastric chemistry was, as Leube, Rokitsanski, Riegel and others have shown, more than a half century ago, little more than guess-work, unscientific, not justified by any known published records, and might in fact prove harmful to patients." Recent evidence confirms this last statement. Excessive alkalis may actually interfere with digestion and absorption of food.

Block<sup>18</sup> raised the same question a few years ago. "Why, then, are alkalis used at all? One of the most difficult habits to discard is one that is forced on the physician through long training and example plus the feeling that possibly the patient is being neglected . . . if some alkali is not administered. . . . I wish to repeat that the satisfaction of appeasing their consciences plays a great part in the use of much alkali by some physicians." Because hyperacidity is a constant finding in an ulcer patient does not mean that it is an etiological factor any more than achylia should be regarded as the cause of pernicious anemia merely because it is associated with the disease with equal constancy.\*

\*These two diseases, ulcer and pernicious anemia, lend themselves to interesting speculation and to further analogy. Briefly, it may be pointed out that they are at the extreme opposites in their secretory and motor function of the first portion of the gastrointestinal tract. This holds true for pepsin and the bone marrow stimulating factor (intrinsic factor) as well as for hydrochloric acid. It is of interest to note that the blood picture of many ulcer patients tends to be above average in hemoglobin and red blood cells with a decided tendency in some cases toward erythemia.<sup>19, 20</sup> The incidence of polycythemia vera is greater among ulcer patients.<sup>42</sup> Rarely if ever do we see these diseases coincidentally. I have not been able to find one authenticated record of pernicious anemia in an ulcer patient and logically it would not seem that such concurrence is possible. (This of course does not include the ulcer patient with gastric resection.) Dr. E. V. Kandel of the University of Chicago tells me she has not found one case of gastroduodenal ulcer among five hundred patients with pernicious anemia. In a similar number of average population there would be about twenty-five ulcer patients. It is therefore apparent that this negative finding among pernicious anemia patients has a definite positive significance. The anthropometric measurements reveal the pernicious anemia patient as quite different from one with an ulcer. "Certain definite elements in the body design of a pernicious anemia patient stamp them as strikingly different from the average run of mankind."<sup>22, 46</sup>

#### SALIENT FEATURES OF GASTRODUODENAL ULCER

If gastric acidity plays no part in the etiology of peptic ulcer, what does? To arrive at some logical conclusion let us first briefly review some of the established facts that pertain to this disease:

1. The lower animals do not develop any ulcers in their stomachs or duodena.

2. The pure Negro is astonishingly free from gastroduodenal ulcers. Rivers<sup>21</sup> studied "two hundred Negroes living in a county seat in central Texas. Negroes of all types were deliberately chosen for this group; most of them, of course, still represented the slow-moving, easy-going type, untouched by aspiration for culture. No instance of ulcer complicated by perforation, obstruction, or hemorrhage was encountered. In only one instance was there sufficient evidence in the history to make a diagnosis of peptic ulcer. Each Negro was questioned regarding his work, education, responsibilities, food and habits. In most instances, the actual living conditions were investigated. The diet of the Negroes was not balanced, and their habits almost invariably included the abuse of tobacco and alcohol. They dissipated recklessly. Their hours of sleep were entirely without regularity. They ate whenever they could and whatever they could get, and they lived under pathetic hygienic conditions; yet the syndrome of chronic peptic ulcer was encountered rarely among them. They were to a great extent without work, and although many of them, even those with large families, scarcely knew the source of the next day's food, they usually seemed surprisingly unconcerned and laughed and jested about their difficulties."

3. A careful anthropometric study of the ulcer patient reveals a constitutional build that is fairly constant. He is generally of the long and thin type, tending to be normal to underweight. The lateral build, or the short and stocky type of individual, generally escapes the disease.<sup>13, 22</sup>

4. There is a definite hereditary factor in a large percentage of cases. We all have seen patients whose brothers and fathers are afflicted with the same trouble. No element of chance could duplicate such familial susceptibility. The real import of only one such case in emphasizing the importance of the chromosomes and the gene carrier of the ulcer syndrome may be fully grasped from Dr. Macklin's article.<sup>23</sup> This is worth anyone's reading. While it does not deal

specifically with the ulcer problem, it lays down some of the broad principles of heredity as they pertain to disease.

5. The male sex is the more susceptible to ulcer, the ratio varying from five to one to ten to one. In those women who are susceptible Dr. Draper<sup>22</sup> was able to demonstrate a strong masculine component.

6. The pathology of a gastroduodenal ulcer is very distinctive. The gross appearance is neat and clean as if cut out by some sharp instrument. The adjoining mucosa is practically normal, even redundant. This has had more recent confirmation from gastroscopic studies. This excess normal mucous membrane often hangs over the edges of the ulcer to give it the effect of slight undermining. The serosa that forms the crater of the ulcer is thick, dead-like in appearance and feeling, which condition is due to extensive thrombosis and induration. This tissue plagues the surgeon in perforation and hemorrhage, as stitches will not hold, and therefore wide resection up to normal tissue must be made. These ulcers are clean bacteriologically.

7. A personality study of an ulcer patient is one of the most intriguing and worthwhile of all aspects of the total study, yet the most difficult to record. After a study of some five hundred ulcer syndrome patients, it has become apparent that a large percentage of them belong to a definite type with a similar emotional response to conflict. They display a relatively calm exterior and "do their worrying alone and within."

In general we might describe the ulcer patient as belonging to the active, driving group (with some reservations) in contrast to the slow moving, slow thinking, lethargic group. This is manifest both mentally and physically, but particularly in the former. "My mind is working all the time. Often I can't sleep because I think of what I'm going to do the next day at the office, or I'll play a four hand bridge game over again. I've always got to think of something all the time. Sometimes I am so active in my mind that I know I won't fall asleep so I don't even go to bed. No use lying down and thinking about everything." There is not only increased quantitative cerebration, but qualitative likewise. Chronic ulcer is seldom found among the feeble-minded. The ulcer patient is alert and intelligent with a quickened intellectual response. Neither his mental nor physical activity is long

sustained. The ulcer patient shifts from subject to subject, seldom finishing one at a single session. He seems in a hurry, driven by a restless urge to work, to be busy and occupied with something, but he fatigues easily with each spurt and soon is in need of a rest.

Most ulcer patients admit they do not concentrate well. They like to skim over a lot of subjects instead of devoting all their time to one, probing its depth. Yet for the initial effort and for a given brief period the concentration may be equal, if not better than average. But all admit that this seldom is maintained over a very long period. Their memory is notoriously bad and their mathematical ability equally poor. Very few failed to admit these two shortcomings. Although some admitted being hasty in their judgment, many claimed and gave objective evidence of executive ability and efficiency.

The average ulcer patient is not a neurotic in the narrow sense of the word.<sup>24</sup> He is not given to complaining. A few may even tend to minimize their symptoms. Many suffer with their dyspepsia for years before seeking medical advice. In their description of the disease they are very objective and accurate, often insisting that they do not even have any pain. Instead they describe their symptom as distress or an uncomfortable feeling; they are not hypochondriacs. Nor do I recall one ulcer patient of the several hundred interviewed that could be classified under the syndrome of anxiety neurosis or compulsion neurosis. You seldom hear an ulcer patient complain of vertigo, paresthesias, palpitation, pressure in the head, tenseness and tightness back of the eyes and a feeling of disintegration. The pulse and blood pressure are not elevated in the ulcer patient as they so often are in the patient with a neurotic anxiety syndrome attack. Very few complain of nausea. Schindler<sup>25</sup> refuses to classify them as psychoneurotics at all. This is due in part to their apparent calm exterior and a good degree of composure as far as skeletal musculature is concerned. The emotional conflict raging inside is well concealed and often protected from external gaze. From the first impression one might not gather that the psychological factor was foremost in the disease of this externally quiet individual.

Yet on further study one might find a rather tense facies with a worried look. The palpebral fissures are not necessarily widened, nor is there



much of a staring appearance. He seldom smiles at first contact; in fact he is not given to much spontaneous smiling or gaiety. His face muscles are set so as to produce an anxious, tense and worried expression. He is serious as if loaded down with many mental problems and is somewhat reticent. Behind this reserve there is often a challenging disposition. He is not accepting any strange situation and its uncertainty without some preparation for action in case it is unfriendly or hostile. The attitude with some is that all strange situations are to be viewed with suspicion. He even may be glum, as if he were carrying a grudge, until the atmosphere clears, but when he feels assured and safe he begins to unwind. As he becomes more at ease he may even wear a broad, wholehearted smile. He warms to you rather quickly and shows appreciation for any interest in his baffling and long drawn out disease. One said: "I have seen three different doctors and not one has talked to me like this, yet I know that my inward nervousness was back of it all."

The dominant factor in the ulcer temperament is worry. "I fret about little things all the time. This inward aggravation is at the bottom of all my trouble, and I don't seem to be able to do anything about it. When a fellow employee hurts me or tries to put something over on me, instead of giving him a piece of my mind or having it out with him in the open and getting it over with, I carry the grudge with me to lunch, and at home. *I fight it out against myself* for days instead of getting it out of my system." This one patient's description is quite typical of the average. They have no safety valve for pent up emotions. They carry their burdens, hates and angers and seldom lose their temper. When they do it is violent and uncontrollable, associated with marked visceral dysfunction. Broad problems of the future, such as family illness and economic security often do not cause as much worry and tension as the little everyday problems.

Fully 90% admit taking everything too seriously. They are very conscientious and find it hard to be casual about their routine work. They are not satisfied with average performance. They are meticulous and exacting. They often do the work of others in their department or go over their work after working hours. "My boss has told me many times to cut it out, not to stay late. He said, *Let me do some of the worrying*

down here.' But I worry more than my boss. I am my worst enemy when it comes to driving myself. My wife tells me this all the time."

The ulcer patient is an individualist and prefers to go it alone. He does not generally share his griefs and joys. He is very independent and would rather solve his own problems than to rely upon the help of family or friend. Relatives and friends speak of how hard it is to do things for the ulcer person. He accepts favors grudgingly and returns them whenever and as soon as he can.

This strong independent nature probably arises from his sensitiveness. He is inclined to be obstinate and critical of others. He naturally avoids partnerships or combined responsibility because of the danger of disagreement. This may account for so large a percentage of ulcer patients in the medical profession. It is claimed that 40% of the staff of one large clinic in this country suffers with the ulcer syndrome.

The ulcer patient is strongly heterosexual, but it is doubtful if sex plays a determining role in any major psychic episode. It is true that many ulcer patients tell of difficulties and awkwardness in sexual adjustment. The severe and cruel restraints of modern civilization in the field of sex impose their hardships on the ulcer patient equally with the rest of humanity. Only as it contributes an additional conflict in a fixed personality do we regard sex in the psychogenesis of any exacerbation.

Some psychoanalysts<sup>26</sup> claim that a typical conflict-situation developing in different personalities constitutes the psychogenetic background in ulcer etiology. This specific psychological content is described as a marked oral-receptive, oral-sadistic component with a strong guilt reaction. We wish to take strong exception to this theory, as it goes counter to most psychobiological studies, some of which have been set forth in this paper. The ulcer patient has a fixed personality pattern susceptible to any conflict situation. The *grooved pathway* from the brain to the gastrointestinal tract is vulnerable to stimuli of all sorts, and the oppositional environment plays havoc with it. Further, Alexander claims that totally different conflict situations are the cause of irritable colon with diarrhea or constipation. In the author's experience either or both of these symptoms frequently accompany the ulcer syndrome which in itself would vitiate this theory.

We are glad to note that Hackfield<sup>44</sup> does not think that correlating specific psychologic content with specific clinical symptoms will throw much light on the subject.

In spite of their chronic illness, most ulcer patients are optimistic. They seem to look to the future with hope and cheerfulness.

A few pertinent facts about the ethical level increases our understanding of the ulcer patient. It is helpful to make this appraisal in every individual's personality.<sup>27</sup> There is a strong flair for justice. He may be cool and distant, but he likes to see the game played fairly—at home, with friends, and on a national and international scale. He is helpful, generous, considerate and "soft-hearted." There is a strange combination of a dearth of affection for his immediate circle, and an apparently strong compassion for humanity in general. "If I have wronged an individual I feel sorry about it and flay myself until it is righted. I have more than fair respect for other people. I couldn't give anyone the short end of the deal. If no alternative arose, I'd take it myself. I am for people determining their own destiny. I am against dictatorships, if you know what I mean." In other words it would seem that there ought to be more than a fair sprinkling of ulcer patients in liberal groups. It is claimed that Tolstoy fitted in just such a picture.

Those especially true to type, with little admixture, have a facies\*\* that is similar. I often have diagnosed an ulcer patient before any symptoms were given, merely on a brief exchange about the weather or some general topic; and I also have missed some. But the fact that even a few could be guessed speaks for something similar in the facies of the more typical ulcer patient.

8. An exacerbation of the ulcer syndrome is precipitated by worry, heavy responsibilities and frustration and release from these given symptomatic relief.<sup>41-43</sup> This simple observation of causal relationship between emotional conflict and onset of disease has had universal confirmation.

Rivers<sup>28</sup> states that "symptoms of ulcer frequently reestablish themselves during periods of trouble and entanglements . . . and become readily controllable when the patient ceases active work, evades responsibility, and takes a vaca-

tion." Cushing<sup>29</sup> says: "All clinicians are familiar with the facts: (a) that 'highly strung' persons are particularly susceptible to nervous indigestion and associated ulcer; (b) that ulcers become symptomatically quiescent or even tend to heal when patients are put mentally and physically at rest, and (c) that symptoms are prone to recur as soon as the victim of the disorder resumes his former tasks and responsibilities." Russ<sup>30</sup> states, "It is a well known fact that patients resistant to treatment by rest, diet and alkalis often recover completely and suddenly from their symptoms when they are made happy by some occurrence. A trip to Europe, a hunting or fishing trip will often cure these cases of all ulcer symptoms as if by magic."

The following histories of a few patients will serve to demonstrate more concretely the relationship of emotions to gastroduodenal ulcer:

Case 1. F. C. W. Male and married; aged 44 years; height 75.5 inches; weight 153 pounds; chest 35 inches; girth 31 inches; pulse 92; B. P. 124/82. Departmental manager of a very large manufacturing concern. Recently absorbed large competitors and established headquarters in Chicago. Patient established himself permanently here. Residence in a large cooperative apartment building. After two years he received sudden news that the huge new office building would be abandoned and the company would move to the East. Radical shifts followed with uncertainty for all. His future was uncertain. On his first visit he complained of scattered arthritic pains in back and knees. The next time he was afraid of appendicitis. There was pain in the lower right abdomen, worse upon arising and after meals. Cecum was palpable and tender. Descending colon easily outlined, and was cord-like. The third visit he had classic ulcer distress, and x-rays showed the lesion in the first portion of the duodenum.

Case 2. Male and single; aged 23 years; height 67.1 inches; weight 116½ pounds; chest 32 inches; girth 28 inches; pulse 62; B. P. 124/78. Duodenal ulcer. Always took things seriously. "Easily excited and nervous, and it gets me right in the stomach even when listening to a ball game." When twenty-one he worked as a clerk in the County Treasurer's office and went to night school. He worried about his brother and carried the major support of the family. For several weeks before the onset of his illness he had rush work on tax collection. Penalty day was March 15. He worked overtime for a long period. Early in the morning on March 16 he had an attack of paroxysmal tachycardia. Then followed digestive disturbance and ulcer.

Case 3. Male and married; salesman; aged 44 years; height 68.7 inches; weight 172.5 pounds; chest 38 inches; girth 35 inches; temperature 98°; pulse 80; B. P. 98/62. Duodenal ulcer. Has had abdominal discomfort intermittently for about 25 years. Remembers three distinct episodes of major ulcer exacerbation. The

\*\*Some day we will add to the armamentarium of the medical student motion and sound pictures of patients with different diseases so that the important factor of facies may be studied.



first was in 1912 when he was courting a girl. Another and richer chap was giving him keen competition. He had an allowance of only \$1.00 per week, and "I was worrying plenty about winning her." The second was in 1919 when his wife became ill after childbirth. She never regained her strength and finally died of tuberculosis. This was one of the most trying years in his life. The third exacerbation occurred in 1931 when he took \$4000 out of the bank and invested it in stocks. When they dropped three to four points he used other stock as collateral and bought more. In the spring of 1932 he liquidated his holdings with an indebtedness of \$600.

Case 4. B. C. Male; aged 65 years; height 66.5 inches; weight 127 pounds; chest 34 inches; girth 30½ inches; pulse 80; B. P. 138/70. This man had a duodenal ulcer for about twelve years. Gastro-enterostomy at Mayos 1923 and placed on a very strict diet. Felt well for one year when symptoms gradually recurred. In 1932 decided to visit his folks in England. Took medicines and powders with him. After three days on the boat quit his restricted diet, ate everything served him and found no use for powders. Was away five months and enjoyed good health. In a few months following his return to Chicago ulcer pains returned.

Case 5. S. W. Male. Owner of small window trimming business; aged 39 years; height 68.4 inches; weight 160 pounds; chest 37 inches; girth 34 inches; temperature 98°; pulse 66; B. P. 120/70. "I've had stomach trouble all my life, at least since sixteen. I was divorced in 1925 and was very sick the following year. Doctored all over. Two x-rays in 1926 showed duodenal ulcer. After all these exams and treatment I was getting nowhere so I decided to go to the North Woods. I took all my pills and powders with me and after three days I felt like a new man. I threw the whole smear of medicines away and ate the grub they served at the resort. I messed around those lakes in all kinds of weather playing at the game of fishing and was fine for five weeks. I returned to Chicago and I was back where I was before in a few weeks."

The causes of emotional upset that result in visceral dysfunction are the common garden variety of difficulties with which we are all familiar, such as social, personal, economic, marital, etc. These difficulties may be investigated sympathetically by the average practitioner (preferably by him) without much probing into childhood experiences or infantile developments<sup>31</sup> or the seeking of symbols in one's dream life. While the latter may help complete a study, they are in themselves not essential in the elucidation of the personality or in psychotherapy.

Parenthetically we wish to add that these observations, made in our daily care of patients, represent a real study of human physiology.<sup>32</sup> Such clinical observations and conclusions are infinitely more important than injecting toxins, acids, or bacteria into laboratory animals or

anastomosing intestine with stomach to discover an ulcer in tissues which never contacted hydrochloric acid in their normal physiology. Unfortunately, any laboratory experiment accompanied by elaborate charts and logarithmic equations has in the past overawed the general practitioner. He abandoned or forgot his own human experiments and accepted those of the guinea pig. Did they not carry the prestige of the university laboratory, and who was he to dare challenge their conclusion? The pattern of modern research has been probably too much a laboratory pattern. We must restore to the general practitioner the role of investigator of human physiology, and renew and revive a new interest in its applications, especially in the field of human emotion and its relation to "functional" and organic lesions. Members of the *Homo sapiens* family remain, in the last analysis, the best "guinea pigs."

#### MARSHALING THE DATA

We may now assemble these facts about gastroduodenal ulcer and see where they lead us.

Heredity plays a strong role in gastroduodenal ulcer, as it does in most other diseases. In clinical medicine generally we are just beginning to evaluate, the great importance of the chromosomes and genes in transmitting immunity and susceptibility to specific diseases. It is easily measurable in the ulcer patient because the father or some more distant ancestor transmits not only the ulcer syndrome to his son, but likewise his body build and "diseased" personality<sup>32</sup>—a long and thin individual with a more or less fixed behavior pattern associated with an innate urge to worry.

Because of these facts we speak of the ulcer diathesis or constitutional or individual susceptibility. The very limited site selectivity of the ulcer to the lesser curvature of the stomach and to the first portion of the duodenum is further confirmation of this inherited predisposition. Obviously there must be something defective in the psychosomatic background of the susceptible ulcer person which links up directly with the few inches of vulnerable stomach and duodenum. There must be something radically wrong with this narrow strip of tissue that constitutes so insignificant a portion of the whole gastrointestinal tract, or with the innervation reaching it. We are led to the latter conclusion because this area "is more actively innervated than any other part of the stomach and therefore more sensitive

neurologically. . . Hence any exogenous disturbance affects the autonomic nervous system of the stomach of the lesser curvature. . . Moreover, there is . . . a specific musculature structurally resembling the sino-auricular nodal center of the heart."<sup>33</sup> Barber<sup>34</sup> states that "the lesser curvature forms the pathway for the vagus nerve trunks . . . which are loosely incorporated in the serosa." Durante<sup>35</sup> states that the very life of the gastric cell depends upon the "sympathetic" nervous system which controls circulation, secretion and motility.

The enhanced motor and secretory physiology of this small portion of the gastroduodenum is not due alone to the greater innervation to these parts. The axons with their endings only relay impulses. Their function is passive and dependent. The power station is essentially in the brain stem and the hemispheres. Their individual or combined activity determines the quality and quantity of impulses that are set forth in continuous discharge along the nerves to the vascular bed, secretory cells and musculature of stomach and duodenum. It is thus seen that disturbances of these functions in a large percentage of cases must be sought not in the stomach's interior, but rather outside, higher up, in the interior of the brain.

It has been known for centuries that the emotions could influence the motor and secretory functions of the stomach and duodenum. The literature is too full of classic experiments by the great physiologists to need any repetition here although mention should be made of Cannon's<sup>36</sup> monumental contributions during the last generation, and of the most recent classic monograph by Wittkower.<sup>37</sup>

Recent experimental work in human physiology should convince the most skeptic of physiologists that the motor and secretory activity of the human stomach and duodenum are functions of its nerve supply. For the first time in literature there is a report of the splanchnic nerves being cut on a patient with diabetes resulting in hypermotility of the empty stomach and increased gastric tonus and amplitude of contraction.<sup>38</sup> Further corroborative evidence is being furnished through other experimental work on human beings. "Experimental evidence from a variety of sources has demonstrated the important role played by the central nervous system

in gastrointestinal motility. This concept is too recent an acquisition to have reached the textbooks of physiology."<sup>40</sup> Is it not, therefore, most logical to seek the etiology of this disease (that is essentially a disturbance of its motor and secretory function) in a disturbance of the autonomic innervation?

The increased motor and secretory activity of the stomach and duodenum determine the dyspeptic symptomatology of the ulcer patient. There is no pathological function of his upper gastrointestinal tract that cannot be produced by enhanced innervation. Hypermotility, hypercontractility, hypertonus, spasm of the pyloric segment, rapid emptying time, all classic features of the ulcer picture, are disturbed motor functions of the gastroduodenum produced by increased excitatory nerve impulses to the musculature.

Hyperchlorhydria, hypersecretion, increased pepsin production, increased bone marrow stimulating factor are hyperfunctions of the glandular structures of the stomach and duodenum of the ulcer patient and represent increased impulses relayed to the glands. The nerve fibrils reach the glands and musculature through blood vessels where disturbed innervation produces spasm and thrombosis.

Fitting in beautifully with this is the personality of the ulcer patient, his emotional instability under conflict, and his almost morbid and uncontrollable tendency to worry. We know that such emotions can upset the secretory digestive and motor functions of the gastrointestinal tract in certain patterned individuals with inherited "grooved pathways." They play special havoc with the ulcer bearing area. We have seen that heavy strain, work, or responsibility, causing increased worry, can upset the central control of the smooth balance of the digestive tract and produce an exacerbation of the ulcer syndrome.

This clinical observation of a causal relationship between worry and ulcer syndrome exacerbation is attested to by physicians all over the world. When the ulcer patient is removed from the strain and responsibility that causes the worry, his symptoms disappear. Besides this clinical evidence of symptomatology and worry, we find the ulcer itself lends pathological evidence to our theory. It is not an infectious type



of ulcer. It is clean bacteriologically and appears as if cut out by a knife, like trophic ulcers of the leg. There are many thrombi showing effect of continued spasm. The mucosa is actually less damaged than the serosa and adjoining layers.

*Summary.* Considerable space has been given the subject of hyperacidity because it serves to many physicians as an insurmountable barrier to free and open discussion of gastroduodenal ulceration. Data are presented to prove that the content of the stomach plays no part in initiating an ulcer. The weight of evidence is sufficiently strong to ignore, hereafter, the role of hyperacidity as central in the ulcer question. We should like to state at the danger of repetition that factor number three in the above list of factual material is alone sufficient to discredit the hyperacidity theory. It states that hydrochloric acid or pepsin cannot produce an ulcer in 80% of the stomach of a susceptible subject. The greater curvature and the cardiac portion are singularly free from psychogenic or chronic ulcer. They do not occur here. This greater area of the stomach lining resists destruction by acid or pepsin. Why should only a narrow strip of the upper alimentary canal be subject to ulceration, and the bulk of the stomach escape it? This unique localization of the ulcer stares mockingly at most theories which sidestep it. Our attention should be directed toward this area, and at least some adequate explanation offered. We cannot dispose of it by repeating catch words of older writers, such as "magenstrasse" or "end arteries." Too many self inherent refutations present themselves.

A sketchy study of the ulcer personality is presented. He is shown to be a long and thin individual, chiefly of the male sex, and given to excessive worry. Heavy responsibilities at work or social frustrations are shown to be factors causing an exacerbation of the ulcer syndrome. Rest and release from worries bring symptomatic relief.

*Conclusions.* Emotional conflict in an individual with ulcer diathesis is alone essential for the production of chronic gastroduodenal ulcer.

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## THE NEGATIVE TUBERCULIN REACTORS

### *Observations and Notations*

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So frequent and extensive have been the articles and publications in recent years on positive tuberculin reactors, that today, the common practice among physicians and internists generally, not alone the specialists, but even the simple country practitioner, once a patient tuberculously exposed is believed to be infected, is to at once make a tuberculin test. The most common of these is the Mantoux and later in this paper I will have more to say about the correct method of giving the same. Simply, it consists in the application locally to the body of artificially produced tuberculin and if this is followed in from twelve to twenty-four hours by a local reaction, i. e., a slight nodule or inflammation at the point of application, it is said to be positive.

In the tuberculously infected individual there is present in the dermal tissue a toxin known as tuberculin and in such a person the application

of artificially produced tuberculin may be followed by a positive reaction. All such positive reactors are at once advised that they must be kept under constant observation, x-ray examinations made of them from time to time and the routine treatment for tuberculosis strictly followed.

Unfortunately, however, the negative reactors, that is, those who for one reason or another do not react positively to the Mantoux test are at once dismissed and forgotten. It is the contention of the writer that this is a serious mistake; that having been under a similar field of exposure all should be held for further observation, the negative as well as the positive reactors.

All negative reactors belong to one of three groups:

Group 1. First, there is the individual who never has been infected. Never having harbored, or came in contact, with manifest tubercle bacilli, his body has never been called upon to produce any immunizing or antigenic agencies and, therefore, no antibodies are present in his system. This non-allergic individual will, of course, give a negative reaction to the Mantoux, or other tuberculin test and, so, we say of him that the test was given too early.

It must always be borne in mind that the mere existence or the implantation of tubercle bacilli into the human body does not necessarily constitute infection. Infection takes place only when the body becomes cognizant of the presence of these invaders and offers resistance. This is evidenced by the production of defense agencies, anti-bodies, and by the dissociation or breaking down of this newly present tuberculo-protein in the body, in the derma, and by the body's efforts to free itself from this toxic material. When such a condition exists the tuberculin or Mantoux test results in a positive reaction and we say of such a person that he is tuberculously infected but not necessarily yet tuberculously diseased.

Group 2. Second, there is the individual who is toxically or moribund tuberculous who has tuberculo-protein substance present in his body to the degree where he will no longer react to the tuberculin application. The antigenic agencies necessary to produce antibodies no longer exist. Hence, there is no dissociated or changed tuberculin present in the body tissues. If, therefore, artificial tuberculin is applied *intradermally*, by



the Mantoux test, the reaction will be negative. This, for the reason that the modified tuberculin from the bacillary growth within the body and the tuberculin added to the derma when the test is made are identical. You cannot have a positive reaction unless the tuberculo-protein in the body is changed, chemically altered, or dissociated and in one toxically tuberculous this is not possible. We say, therefore, of such a person that the tuberculin test was given too late. In describing this condition the German medical writers on the subject very happily, and I may say correctly, use the word "Ab-bau," which means a "breaking up," "reducing," "down-building."

It is important to note, however, that there was a time in the life of the toxically tuberculous individual, whether shorter or longer past, when had a Mantoux test been given the reaction would have been positive. He was not always a negative reactor. There was a time when the skin was capable of reducing this body generated tuberculin and neutralizing the same. It is a well known fact, of course, that the skin is a large reservoir wherein the toxic products deposited in the human body by various bacilli found therein are reduced and eliminated from the economy. The toxically tuberculous, however, has long since become overwhelmed or saturated with the toxin, and is, therefore, no longer capable of reducing the body-produced tuberculin and in such a person no positive reaction can, or ever will, follow to a tuberculin test.

Group 3. This group embraces that large class of neglected, negative tuberculin reactors, who on the first Mantoux failed to react positively but who, experience has shown, had the test been repeated some months or years later, would have given a positive reaction and this, I may add, without reinfection from without.

In this class of cases, tubercle bacilli are often present in the body at the time of the first tuberculin application but no antigenic agencies or antibodies had yet been brought forth as the body had not yet felt the need of them. In these individuals the tuberculo-protein, if any, given off by the bacilli, had not yet undergone any changes and hence there was no reaction to the test. Here the first application of the tuberculin was given too early, but had it been followed by subsequent tests might well have produced a positive reaction.

We know from observation, and we now teach, that tubercle bacilli after entering the human body may become encapsulated, or surrounded by epithelial and other cells, or by lymphoid tissue or encapsulated and encased in lime deposit and so may remain dormant for many years, coming into play only if the body's powers of resistance are lowered.

It is well known that in cases of the toxipathic factors like injury, shock, sickness, grief, anxiety, undernourishment, irregular hours, insufficient rest, etc., where body vitality may be lowered that these walled off germs leave their imprisoned areas for new and more favorable localities, locating themselves in new fields in the human body where they propagate and multiply producing in their host the disease "tuberculosis."

When tubercle bacilli are implanted into the human body the Mantoux test does not at once become positive. A positive reaction follows only when the invaders begin to grow or multiply and only after they have given off their toxic principle, the tuberculo-protein substance and have aroused the body's defensive agencies and these resultant antibodies begin to combat this toxic substance. As this battle goes on the toxic element resulting from the bacillary growth is taken up by the tissues of the skin and mucous membranes where it is modified and changed into a less toxic product and finally eliminated from the body. It is only when this modified bacillary product, this changed tuberculo-protein is actually present in the dermal tissues, and then only, that the application of artificial tuberculin will produce a positive Mantoux test. So long as the tuberculin is present in any non-dissociated form, that is, remains in the body unchanged and unreduced, no reaction will follow from the application of artificial tuberculin for, as already stated, the two are identical. It is the changed tuberculin in the human body which makes the individual allergic.

In recent years there have appeared in medical journals numerous articles dealing with the frequent tuberculous disease in young medics and nurses, themselves engaged in training the tuberculous, the contention being that because these individuals were negative reactors when they entered this work and later, after continuing therein for some time, were positive reactors, that they contracted tuberculosis in their work through contact with others having the disease.

It is the writer's belief that many, perhaps all, of these subsequent positive reactors actually harbored living tubercle bacilli in their tissues at the time of the original Mantoux but as no tubercle-antigenic agencies were yet present, the first test was negative rather than positive.

The writer believes from observation and experience that many of these young medics and nurses were actually exposed to the disease in infancy. Perhaps, as happens very commonly, they were left from time to time in the care of some aged relative actually, but unknowingly, suffering from the disease. In later life although these same persons are very careful to avoid active tuberculous contacts and guard themselves against infection, they learn to their surprise that in spite of these precautions they are in imminent danger of early becoming actively diseased. In thirty years or more of active work with the tuberculous, the writer has traced the infection to early childhood in upwards of a thousand of such cases. The tubercle bacilli have been dormant in the bodies of these individuals for many years and were so dormant when they entered upon their medical and nursing duties. While their new labor may have lowered their vitality, the fact is overlooked that the same result would have followed had these individuals entered any other calling or occupation. They are now no longer mere bacilli carriers but have become in reality infected and diseased, not from sources outside of their own bodies, but from the tubercle bacilli which they have for years carried in their own tissues and which have now become activated. Accordingly, the positive tuberculin reaction now brought about is, in the writer's opinion, caused by the harbored bacilli within the bodies of these individuals, which bacilli were there long before they engaged in their present occupation or calling, a fact which these writers entirely overlook.

It has also been our experience that in many of these cases where the Mantoux was originally negative that the test was not scientifically or accurately given. May I say at this point that the correct Mantoux technique requires the giving of the tuberculin in a centrifugal manner, intradermally, and not subcutaneously. To illustrate, we may give 1-10 of a C. C. or more of 1% solution of old tuberculin, say, in the upper right arm, doing so incorrectly by introducing it subcutaneously. No reaction will follow and

nothing more will be noticeable, than perhaps a slight reddening at the point of the needle puncture. Let us now take the same individual, introduce the same kind of tuberculin, say, in the upper left arm doing it correctly by placing the needle intradermally and delivering the tuberculin into the skin and not under it. Soon a slight elevation will be noticeable and the point left by the needle will lie in the center of a round slightly raised area like the center of a hub in a wheel. Here we have the same person and the same tuberculin except that in one case the procedure and technique applied in giving the test is correct, in the other incorrect. In the right arm no reaction will develop. In the left arm a positive reaction will follow within twelve to twenty-four hours.

We read frequently also in the various journals and periodicals statistical results following the administration of Mantoux tests to large groups of school children, the reports showing positive reactions in as low as 8.5% of the cases. To the experienced tuberculous practitioner, it is at once evident that probably the test has not been correctly given for if it had the percentage of positive reactors would have been much higher.

But let us now assume that the Mantoux test, even if most properly given, in school children in the larger cities of our country it may vary greatly in number from that given to the school children in the rural communities. In the middle and eastern part of our country the Mantoux test when compared to the test as applied to school children of the middle and northern part, in number, may vary perceptibly and again the difference in the number of positive Mantoux tested school children in the larger cities when compared to the rural number may also vary and again the percentage of the positive Mantoux reactors in the larger cities is much in excess to the number of positive reactors given in rural communities, hence we may infer from all this that tuberculosis as a disease is much more prevalent as an active and infectious disease in large cities than in the small communities. In noting the statistical records we observe a similar condition existing in Europe.

#### *Conclusions*

We observe, therefore, that a negative tuberculin reactor is not necessarily free from tuberculous infection or disease; that he may be har-



boring tubercle bacilli within his body although he may not yet be producing antibodies or defensive agencies. On the other hand, he may have tuberculo-protein present to the degree where he will no longer react to the tuberculin application. It must be admitted, of course, that he may in reality be free from infection and from the disease, but if once exposed even though the Mantoux be negative, it is evident that he should be periodically examined and close attention given to his behavior from time to time. We now know from long observation that many of the negative reactors are negative today and probably positive tomorrow. The vice is that these negative reactors are, all of them, immediately forgotten and attention focused only on the positive. It is for this reason we have always laid great stress on the correct technique to be followed in the administration of the Mantoux to assure the introduction of the tuberculin centrifugally, intradermally and not subcutaneously.

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## EXPERIMENTAL INFLUENZA

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While several investigators have successfully demonstrated in animals, especially ferrets, the presence of a filter passing virus in the sputum of influenza, there are few reports of studies on human volunteers, especially with the blood of influenza. One of the most thorough investigations was made in 1919 by Yamanouchi, Sakakami and Iwashima<sup>1</sup> who worked with 48 human volunteers. 1. An emulsion of sputa from 43 influenza patients was made in Ringer's solution. This emulsion was injected into the nose and throat of 12 healthy persons. 2. A Berkefeld filtrate of the same emulsion was injected into the nose and throat of 12 other healthy persons. The results of these experiments were that 18 subjects became ill. The incubation period was two to three days. 3. A filtrate of blood of influenza patients was injected into the nose and throat of six healthy persons. All six became ill with influenza. 4. Four healthy persons were inoculated subcutaneously with filtrates of the blood of influenza patients. All became ill after two to three days of incubation. 5. A pure culture of Pfeiffer's bacillus and a mixed prep-

aration of pure Pfeiffer with pneumococci, streptococci, staphylococci, diplococci and other microbes common in the sputa of influenza patients were injected into the throat and nose of 14 healthy people. There were no symptoms of illness following these injections.

Levick<sup>2</sup> reported that influenza developed in a patient suffering from pernicious anemia 48 hours after receiving a blood transfusion. The donor had not entered the patient's room. The donor became ill 24 hours after giving the blood.

The authors report herein studies of the blood of 44 patients with uncomplicated epidemic and endemic influenza. This diagnosis was made in acute illnesses characterized by fever, relatively slow pulse, marked generalized body aching and a W.B.C. usually under 10,000. In most cases the blood cultures were taken during the first 36 hours of the illness. About 2 c.c. were added to 10 c.c. of nutrient broth and cultivated both aerobically and anaerobically. Forty-two of these cultures remained free of any recognizable bacteria, two were contaminated with hay bacillus. Subcultures were made in the various sugars and on blood agar, chocolate blood agar and brain veal infusion agar, all of which remained grossly unchanged.

To determine the presence of an invisible virus in the blood, inoculations were made on five healthy human volunteers on three occasions. These individuals were placed in quarantine starting two days before the first experiment and so continued until the completion of the third, a period of 18 days.

To test out the protective power of non-specific bacterial vaccine, one of the volunteers (A) was previously injected subcutaneously with weekly doses of a combined catarrhal vaccine.<sup>3</sup> The third dose was given one week previous to the first inoculation of virus.

The virus used had been obtained from the blood of a typical case of influenza with a W.B.C. of 3000. Transfers were made first into nutrient broth and then alternately to brain veal infusion agar and nutrient broth. With the agar media no growth was visible but a small surface scraping was taken from the seeded area after five days of incubation.

First Inoculations (July 14): One c.c. of a Berkefeld W filtrate of the seventh subculture was instilled into the nose and throat of each volunteer. Fifteen hours later the volunteer (A)

who had received the bacterial vaccine complained of dryness of the nasopharynx and generalized body aching. There was acute hyperemia of the soft palate, fever and W.B.C. 9900. Three of the other volunteers at the end of 24 hours had fever and W.B.C. of 9900, 10,500 and 11,200, respectively. The fifth volunteer (B) remained well.

Second Inoculations (July 19): All the volunteers at this time had been free of symptoms for three days, and were now given one drop in the nose from the unfiltered ninth subculture of the same strain of virus used in the previous experiment. Twelve hours later three of the volunteers had rhinorrhea. At 24 hours three had fever and the W.B.C. ranged from 7100 to 8950. The fourth had a headache and cough, while the fifth (C) remained well.

Third Inoculations (July 26): In this experiment the first broth subculture of the virus was used, three drops of the unfiltered culture being instilled into the nose and throat. Twenty-four hours later one of the individuals had a sore throat, nasal discharge and generalized body aching. The W.B.C. was 9550. A second volunteer had sore throat, headache and W.B.C. 8950. By the end of 48 hours two other volunteers complained of sore throat, cough, fever, with W.B.C. of 7050 and 9000, respectively. The fifth (D) remained well. All the symptoms had subsided by 96 hours.

On Aug. 11 five drops of sterile nutrient broth was given by nose and throat to each volunteer and all remained free of symptoms.

#### Summary and Conclusions:

Confirming the experiments of Yamanouchi and his associates, a filter passing virus is present in the blood of early uncomplicated cases of influenza.

Influenza-like symptoms were produced in five volunteers in 12 of 15 attempts following nose and throat inoculations. Previous inoculations with a commercial catarrhal vaccine in one volunteer did not prevent infection.

One attack of mild experimental influenza did not prevent two later attacks with the same strain of virus, though the symptoms were less in the third experiment.

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3. Vaccine contained H. influenza, Streptococci, Pneumococci, B. Friedlander, Micrococci catarrhalis, Staphylococci albus, and Staphylococci aureus, totaling 1800 million per c.c. Doses were  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and  $\frac{3}{4}$  c.c.

### SUBACUTE POLYMYOSITIS:

#### Report of a Case

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The rare occurrence of this obscure disorder, known as polymyositis, and its infrequent description in the American literature prompt us to report our case and give a brief resume of the present knowledge of this disease.

*Case History.* Mrs. N. O., a white woman aged 38 years, entered the St. Mary of Nazareth Hospital on January 27, 1936, complaining of pain and weakness involving the skeletal musculature, dating from November 1, 1935, when she first developed a peculiar vesicular inflammatory process in the skin over the dorsal surface of both hands in the region of the metacarpophalangeal articulations. The physician whom she consulted at that time incised the areas and evacuated a small amount of thin, apparently non-purulent fluid. While healing of the hands occurred, her general weakness progressively increased and she felt as though she were "bruised all over." About a week prior to hospitalization, she became bedridden and so profound was the asthenia that she was unable to raise her head from the pillow, complaining that it felt "like jelly." Her fingers were too weak to press the bell at her bedside to summon a nurse.

Physical examination on admission revealed a fairly well developed and well nourished white female, apparently not acutely ill but suffering considerable pain even on slight motion. Her teeth were carious and x-ray of the roots showed several apical abscesses. Posterior cervical lymph glands were slightly enlarged. The chest was negative for lung or heart involvement and the abdomen revealed no palpable masses, tenderness or rigidity. The spleen was not enlarged.

On February 10, 1936, examination of the neuromuscular system revealed the following:

Pupils were equal, regular and reacted sluggishly to light and accommodation. The ocular movements were normal and there was no nystagmus. The face presented an appearance of stiffness but the movements of expression were within normal limits. Articulation was clear and unimpaired, and the patient cooperated cheerfully and intelligently. Hearing was normal. The pharyngeal reflex was present. The neck movements were extremely feeble and the patient was incapable of raising her head from the pillow though she retained fair ability to press backwards with the head. Tongue strength on protrusion and cheek pressure was normal and symmetrical.



*Extremities.* The arms were held in flexion, with hands resting on the abdomen; legs in slight flexion, feet in moderate foot-drop position. Active movements were slight and feeble, while passive movements were limited by contractures and pain which were most acute in the flexors of the forearms.

*Deep reflexes.* McCarthy sign and jaw-jerk were present. The other deep reflexes could not be elicited even on reinforcement.

*Superficial reflexes.* Abdominals were present. Babinski, Chaddock, Gordon and Oppenheim were negative.

*Sensory system.* There was no anesthesia to light touch, pain and temperature, but the patient complained of numbness of the finger tips. Proprioceptive and

areas of dense accumulation of inflammatory cells, neutrophils, eosinophils, plasma cells and round cells, the latter predominating. Many of the muscle fibers reveal definite degeneration with areas of complete loss of structure and marked fatty degeneration. The process appeared to be inflammatory but no trichinae or other specific process was noted.

*Treatment.* The treatment of this patient was entirely empirical. She received daily warm baths followed by gentle massage. Intramuscularly she was given twelve injections of aolan, 10 c.c. per dose, every third day. Two weeks after admission she was unable to take solid food, necessitating the feeding of liquids in small amounts. From February 15 to 27, her extremities were exposed to x-rays on alternate days, with no appreciable results. Finally, at the suggestion of her relatives, the patient was transferred for therapy to Hot Springs, Arkansas. On the sixth day of her stay there, a gastrostomy was performed and she died twenty-four hours later, the total duration of her illness being five months.

*Discussion:* The first description of polymyositis was given by Unverricht<sup>1</sup> in 1887, and

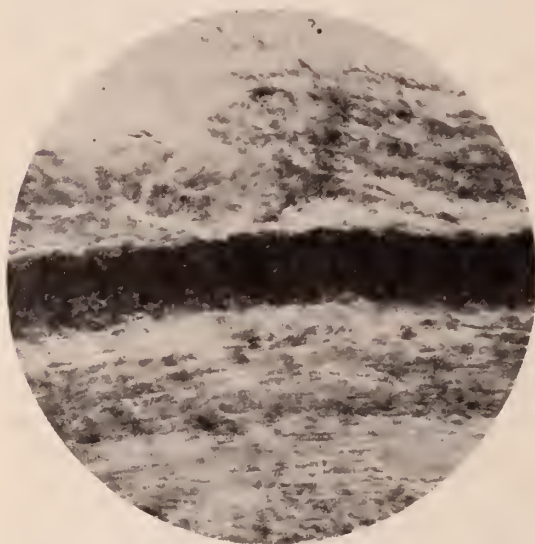


Fig. 1. High power section showing marked fatty degeneration of muscle fiber.

stereognostic sense was normal. The skin presented a pale, waxy, shining appearance with pitting on pressure in the lower extremities.

The temperature range was irregular, never reaching above 101° F., frequently being subnormal. The pulse varied from 80 to 100 and respirations from 20 to 24. Blood pressure was 100/65.

*Laboratory Investigation:* Blood count showed 3,890,000 erythrocytes, 80% hemoglobin; 11,150 leukocytes, with neutrophils 74%, lymphocytes 22%, transitionals 4%, and eosinophiles absent. Blood calcium was 9.8 mgm. Blood Wassermann and Kahn reactions were negative.

Blood culture showed no growth after ten days of incubation, and muscle particles obtained with a large caliber needle were also sterile.

Urinalysis was negative, and quantitative determination of creatinin yielded 0.818 grams as compared with the normal range of 1 to 1.5 grams.

DRS. L. R. HILL AND J. J. MOORE

*Pathological report* on biopsy from the left biceps muscle performed February 13: The specimens consisted of a piece of muscle 5x5x3 mm. The microscopic sections revealed striated muscle with many

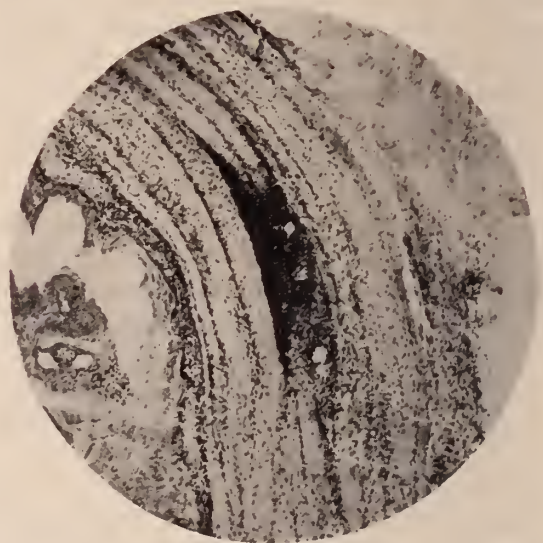


Fig. 2. Section showing dense localized round cell infiltration.

shortly after by Wagner and Hepp. Twelve years later Lorenz collected fifteen cases and suggested the following classification:

1. Dermatomyositis.
2. Myositis hemorrhagica.
3. Myositis with erythema multiforme.
4. Special types.

To this classification, later was added

5. Neuromyositis, by Senator who observed one case in which combined muscle and neuritic lesions occurred. In 1891, Strumpell was able to give a fairly clear clinical picture of this disease.

Polymyositis runs an acute, subacute or chronic course and varies in duration from about two weeks to nine years.<sup>2</sup> The majority of cases follow a subacute course terminating in three to six months, with usually a fatal outcome. The onset is insidious with pain, weakness and stiffness of the extremities, and early swelling noticeable especially about the face, hands and feet. The skin may present erythematous, erysipeloid or urticarial changes which often disappear early, leaving no evidence of their existence or but a slight discoloration. Locomotion rapidly becomes difficult and then quite impossible, forcing the patient to bed in a state of progressively increasing helplessness. The deep reflexes become depressed and at times cannot be elicited due to swelling and stiffness of the in-



Fig. 3. High power photo micrograph showing muscle fibres with loss of cross striation.

terstitium. The electrical reaction is decreased and finally disappears entirely.<sup>3</sup> Swelling of the spleen is frequently noted while a slight or moderate elevation of temperature is invariably present. Cutaneous sensibility and the mental state remain intact. Gradually the patient notices that mastication of solid food is impossible; even deglutition of liquids becomes difficult and artificial feeding must be resorted to. Death finally terminates the disease, due most frequently to complicating pneumonitis. If the patient recovers, secondary muscular atrophy always follows.

On autopsy the muscles present marked changes. Grossly, they appear decolorized, pale or waxy, resembling rabbit or fish flesh. Microscopically, either interstitial or parenchymatous inflammatory changes predominate. The muscle fibers show loss of striations, atrophy, wide separation of fibers and fragmentation. The inter-

stitial tissue is edematous and presents collections of leukocytes, lymphocytes and small or moderate hemorrhagic areas. There is no involvement of the peripheral nerve fibers. Whether the cardiac musculature always takes part in the inflammatory process cannot be stated definitely, although Edmund Von Zalka,<sup>4</sup> in a case which came to autopsy after an illness of twenty days, observed changes in the heart similar to those found in the skeletal muscles and in a case reported by Oppenheim, death came after an apparent improvement, due to myositis of the heart muscle.

The diagnosis of polymyositis is not especially difficult. It must be differentiated from trichinosis, which it resembles clinically so closely that Hepp called it pseudotrachinosis. However, the preliminary gastrointestinal symptoms and eosinophilia are lacking in polymyositis and the parasite cannot be found in a biopsied specimen. Eosinophilia alone is not a differential feature as it has occurred to the extent of 24% in the case reported by S. Van Creveld.<sup>5</sup> Polyneuritis is ruled out by the lack of sensory changes and absence of pain and swelling along the nerve trunks. In polyarthritis the principal involvement is in the joints and the muscles are only secondarily affected. Periarthritis nodosa simulates polymyositis but biopsy shows absence of involvement of the arterioles. Amyotrophic lateral sclerosis is accompanied by a marked atrophy of the upper extremities and hyperreflexia in the lower, findings absent in polymyositis. Finally scleroderma rarely may warrant consideration but here the integumental changes predominate.

The etiology of polymyositis is entirely unknown. It has followed influenza, tonsillitis, articular rheumatism, meningococcal infection, gonorrhea, syphilis, tuberculosis and measles. Gluzinski,<sup>6</sup> in 1899, called it polymyositis acuta progressiva infectiosa, and attributed the portal of entry to the tonsils. A. Frankel, Kader, Wiesner and others believed this condition to be metastatic even though there is no suppuration. Kader thought that the infiltration marks really the beginning of suppuration and refused to distinguish between suppurative and non-suppurative types.

Oppenheim and Lorenz believed polymyositis to be a specific disease process. That the disease is infectious seems apparent from the py-



rexia and the splenic enlargement. Thus far most of the attempts at culturing were negative. Lundsteiner found a streptococcus identified by Wiesner<sup>7</sup> as the streptococcus pleomorphus which according to him also causes lethargic encephalitis. According to Pfeiffer, a similar symptomatology occurs in animals following infection with Gregarina (myositis gregarinosa).

*Conclusion.* A case of subacute polymyositis with a fatal outcome is reported.

Attempts at obtaining cultures on ordinary media yielded negative results.

Animal inoculations are suggested as the next step in the investigation of this puzzling disorder.

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#### TUBERCULOSIS CONTROL IN OUR EDUCATIONAL INSTITUTIONS BY THE TUBERCULIN X-RAY PLAN

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The paramount objective of a tuberculosis preventive program is to reduce the number of tuberculous foci throughout the country in order that the populace will pass through the periods of infancy, childhood and adulthood without infection. The vital importance of early diagnosis must be recognized as a threefold purpose, if the problem is to be met properly. This includes the welfare of the patient, protection of the public against open foci of infection and the eventual reduction of expenditure of public and private monies for the care of tuberculous patients by control and eradication of the disease. Control, heretofore, has been more or less of a haphazard type. By a systematic procedure far greater progress can be made.

The contents of this report are given with the hope that they may stimulate a greater interest in prevention, early diagnosis and control of tuberculosis. This can be done by a definite procedure which will include the entire future generation, through our educational institutions. The greatest portion of the data has been obtained from colleges and universities. The method of attack is just beginning to find its way into a few of our high schools and grade schools.

It is very important that the students of our institutions of learning be carefully protected from tuberculosis. An early active, unrecognized case is a serious handicap to the individual. If allowed to progress into the moderately active or far advanced stage, the outlook for that individual to earn his own livelihood, to retain his maximum efficiency and to fulfill his ideals are inestimably impaired. Many of our educational institutions are composed of a heterogeneous group of students. We know that certain races and nationalities are prone to develop this malady more than others. The majority of college students live healthy, well adjusted lives, but there are certain factors which are conducive to the development of tuberculosis. There are students who have had the bare necessities of life and who are sacrificing their own health, or at least are giving that particular phase very little attention in order to attain a higher education. This is especially true for the period of economic depression through which we have been passing. Many of these students are potentially tuberculous, for they have failed to observe the regulations of proper food, required amount of sleep, proper exercise and early medical care. If tuberculosis is to be controlled, it is of prime importance that the open cases be sorted out, that the childhood type of infection, suspicious cases and contacts be observed at intervals.

Conditions imposed upon the student who is so unfortunate as to contract this disease, cause serious economic loss to himself, to the school and to society. It is estimated conservatively by the Tuberculosis Committee of the American Student Health Association<sup>1</sup> that tuberculosis among college students alone is costing the country at least \$27,000,000 annually. Our sanatoria are filled with tuberculous patients and by far the majority of these hospitals are supported by local or state taxation. The Council on Med-

ical Education and Hospitals of the American Medical Association<sup>2</sup> indicate that there are 1240 institutions caring for tuberculous patients. Of this number, 807 are supported by federal, state, county and city means, whereas, only 433 are privately supported institutions. In a 12 months period, 121,706 admittances occurred. The total cost of tuberculous hospitalization exceeded \$71,000,000 per year. Of these admittances, 84.4% of the patients received free treatment, 19.2% paid in part, and only 6% paid in full for care. The total replacement value of these institutions is estimated at approximately \$329,000,000. Since the hospitalized cases represent only a small percentage of the active cases of tuberculosis, it can readily be seen that the economic loss due to this disease is almost unbelievable. The Committee on Waste in Industry of the Federated Engineering Society estimated the annual cost of tuberculosis to the United States at \$500,000,000. A survey made by the Metropolitan Life Insurance Company<sup>3</sup> showed 85% of the persons hospitalized for tuberculosis in the minimum stage, 50% of those in moderately advanced stage, and only 16.6% of those in far advanced stage were still working after being discharged as arrested cases. Through early diagnosis and proper care, the chances for recovery are excellent, the economic loss to the individual, community, state and federal government is minimized, because the period of disability can be greatly shortened.

Although there is a reduction of the death rate from approximately 200 per 100,000 in 1900 to 56 per 100,000 in 1933 in the United States registration area,<sup>4</sup> it is estimated that there are more than 700,000 active cases of pulmonary tuberculosis in this country today, with 75,000 deaths yearly. Since there is an average of at least three contacts to every active case, one can readily surmise the vast problem which must be faced in a tuberculosis eradication program. Yes, the reduction has been remarkable in the death rate, yet this malady is claiming more victims between the ages of 15 and 45 than any other disease. It is responsible for one out of every three young women who die between the ages of 15 and 30.<sup>5</sup> The smallest decline in mortality from tuberculosis has occurred in the aged and young people between the ages of 15 and 24. Perhaps one reason for the failure of a proportionate decline in the latter age group is because

they are of a happy-go-lucky nature, full of vitality, zeal and hope and do not seek medical advice for the obscure, indefinite, early symptoms of the disease, if any. This is the age group from which the future leaders of the country are to come. What an unfortunate circumstance it is, both for the student and the country, to have these young men and women break down with advanced tuberculosis during or within a few years after their education has been completed.

Very few cases present the classical symptoms of early tuberculosis. It has frequently been mistaken for influenza, bronchitis, simple pleurisy, hyperthyroidism, or pneumonia. The patient does not always fully recuperate, and later comes down with a full blown case of active tuberculosis.<sup>6</sup> Robertson,<sup>7</sup> after making 3,306 postmortem examinations, concludes that an active tuberculous infection may run its entire course without clinical manifestations, or that it may remain active even though regarded as arrested. He further emphasizes that no form of physical examination can give absolute assurance that a person does not harbor active infection. Weintraub,<sup>8</sup> Wingfield and Macpherson,<sup>9</sup> and others have proven that the physical examination was of little value in diagnosis or follow up of children with the childhood type of lesion. Fellows<sup>10</sup> found that 65% of adults studied roentgenologically were symptom free, or had only one symptom, not in itself pathognomonic of pulmonary tuberculosis. What means have we of discovering these cases? Fortunately, within the last few years, medical science has given us an answer—the tuberculin test. This test stands out as one of the important weapons in the control of the “great white plague.”

When tubercle bacilli enter the body for the first time, there is an immediate effect, which is of a non-specific or foreign body reaction. This inflammatory or pneumonic stage, after weeks or months, may completely resolve, or it may produce a fibrosis and later calcified nodules appear. The regional lymph nodes generally become involved during this initial infection. The first infection, even though it occurs in young adults, is of a benign character. It always precedes the destructive or re-infective type. Simultaneously with the entrance, or very soon after the entrance of this infection, an allergy is produced. This is the foundation for the tuberculin



test. A positive tuberculin reaction indicates that at some time the body has become infected with the tubercle bacillus. In a very few instances, a person loses his hypersensitivity to the tuberculo-protein, Myers and Harrington,<sup>11</sup> but such cases are so rare that they can be ignored, unless clinical manifestations warrant further investigation. For all intensive purposes, a negative reaction means an absence of infection. The fact that a lesion heals, does not necessarily mean that the bacteria are dead, as was formerly thought. These healed lesions may break down enough to disseminate bacilli to the allergic tissues of the body, and a re-infective or adult type of tuberculosis develops. Myers et al.<sup>11</sup> Stewart<sup>12</sup> Shipman and Davis<sup>13</sup> and others have definitely shown, by following students over a period of years, that the chances for the positive reactors to develop the disease in later life are approximately 9 times as great as the negative reactors. Therefore, one is not justified in ignoring or regarding lightly a positive reaction, though there is an absence of clinical findings. One theory, that the person with an initial or mild infection may become partially immunized and is less susceptible or liable to develop active tuberculosis, is supported by one group of physicians. Among the followers of this theory are Willis<sup>14</sup> and Miller and Rappaport.<sup>15</sup> Wallgren of Sweden, Tice and Hruby of Chicago, and Calmette and his associates at the Pasteur Institute of Paris, have been administering B C G vaccine to contact children, on the theory that immunity can be developed by such a procedure. Some of their results are encouraging. Whether or not future work along this line is going to materially reduce the number of open tuberculous cases remains to be seen. Certainly, until this method has become more convincing and well established, it should not be tried, except under expert supervision. If the proponents of this idea can eventually produce a satisfactory method of immunization, it will surely be a strong pillar in our armamentarium against this lurking, treacherous disease. In contrast, Boynton<sup>16</sup> has shown, from statistics gathered in Minnesota where the B C G vaccine has not been tried, that tuberculosis mortality rates in children are lower and have decreased at a more rapid rate than the data reported by Wallgren<sup>17</sup> with the use of B C G. By far the majority of evidence at present does not substantiate the

idea that an infection of a tuberculous nature confers any appreciable amount of immunity.<sup>18-21</sup>

It is erroneous to believe that nearly everyone has been infected with tuberculosis at some time. A few years ago, it was generally believed that 75 to 90% of the population at some time had this disease. The number of active cases and the number of tuberculin positive reactors are diminishing. Shepard<sup>22</sup> has compiled statistics on the incidence of tuberculosis, showing that 0.62% or one person in every 161 of our student population in our colleges is afflicted. He finds that 31% of the students in 48 colleges are positive reactors to the tuberculin test. Reports from different sections of the country vary a great deal in the number of reactors among school children and college students. As a general rule, the more thickly populated areas show a higher incidence of positive reactors.

Miller<sup>23</sup> and others clearly emphasize that the x-ray fails to locate the lesion in at least two-thirds of the primary type of infections. Myers and Harrington<sup>11</sup> found that the reinfective type is uncommon among children under 10 years of age, and they have discarded the use of the x-ray for this age group, unless some specific clinical findings are present. The tuberculin test sifts out the primary or so-called childhood infection, but it gives no information on the reinfective or destructive type of tuberculosis. The x-ray supplies this valuable knowledge before clinical or laboratory methods can detect activity. It must be relied upon in the second portion of this definite program of tuberculosis control. Myers and Harrington<sup>11</sup> and Levine<sup>24</sup> have had students under observation for 15 years. They have seen persons become positive reactors and witnessed the development of the primary lesion with no symptoms. They have observed reinfection from endogenous and exogenous sources. From the years of experience, they emphasize the need of routine, periodic chest examinations including roentgenographic studies of the positive reactors. The importance of this procedure can best be brought home by citation of practical application of the tuberculin- x-ray program.

The directors of the Health Services of 210 of our American colleges have kindly responded to the questionnaire concerning tuberculosis control at their respective institution. Schools with some definite program, other than history and

ordinary physical examination, have been classified. In the first group, 30 colleges and universities were placed. All freshmen and new students are given the tuberculin test and the positive reactors are x-rayed. Group two includes 29 schools in which this plan is voluntary to the student. Examination of suspicious cases, professional students and athletes are included in this class. Some of the schools in group 1 and 2 re-examine the seniors and keep in close contact with graduates for a period of years. Group three includes 15 colleges with fluoroscopic or x-ray routine for all freshmen and entering students, but do not use the tuberculin test.

Thirty-eight students were removed from Yale University on account of pulmonary tuberculosis during the period of 1922-1932. Of this number, Soper and Wilson<sup>25</sup> state that 10 were detected by the routine procedure, without the benefit of x-ray. Twenty-seven passed the routine physical examination unsuspected and subsequently broke down after 1 to 16 months. Barnard<sup>26</sup> found 552 definite cases by x-ray, 80% of these being in the incipient stage which could not be detected by ordinary physical examination. Before a definite tuberculin x-ray plan was instituted at the U. of Wisconsin, Steihm<sup>27</sup> revealed that an average of 10 cases of tuberculosis occurred yearly from 1919-1933. During the school year of 1933-1934, the tuberculin-roentgenogram plan was used. He found 43 cases among the 2,412 students tested. Only 7 out of 26 active cases had physical symptoms or physical findings of the disease. There were 17 cases discovered by this program at the U. of Pennsylvania. Lees<sup>28</sup> states that all the cases were symptomless. Such figures show strikingly, the limitations of ordinary physical examination in anticipating clinical pulmonary disease.

It is interesting to note from this survey, that a greater percentage of students in the upper classes, graduate students, and those included in the professional schools, react to the tuberculin test than do those in the first year class and non-professional courses. Members of the three upper classes of Yale Medical School were 94% positive reactors;<sup>25</sup> 57% were positive in the first year, while 91% showed positive reactions in the fourth year at Johns Hopkins School of Medicine.<sup>29</sup> Opie et al.<sup>30</sup> carried out a very thorough investigation on both medical and college students with the tuberculin test, stereo-

scopic views and physical examination. There was only 1 active case among 279 non-medical students, yet 14 active cases were discovered among the 452 medical students. Thirteen of these occurred in the third and fourth year medical group. Miller<sup>31</sup> has kindly furnished his observations on the medical students at the U. of Louisville. Only 37% positive reactions occurred in the first year class, while 79% of the seniors were positive. Information from other schools are in accordance with these findings.

Much evidence has accrued concerning tuberculosis among nurses. From 10 to 65% of the probationers at the various hospitals had positive reactions. They were 100% positive to the test, and from 3 to 6% became ill with the reinfective type of the disease by graduation time.<sup>13, 32, 33, 34</sup> By the use of contagious technic in nursing such as the wearing of masks and gowns and thoroughly washing of hands after handling patients, this deplorable state of affairs can be markedly improved.

The program of preventive tuberculosis should include the faculty and other employees of our educational institutions. Hall kindly furnished the following data: 68% of the administrative employees of the U. of Washington were positive to the test. Twenty-five showed unmistakable evidence of infection, requiring careful clinical study. One teacher in the Netherlands caused active infection in 30 pupils<sup>35</sup>. Other investigators find that the incidence of positive reactors is much greater among students taught by an open case of tuberculosis than children instructed by a non-tuberculous teacher. The 2190 instructors examined at Minneapolis<sup>36</sup> showed an incidence of 49.2% to the test. There were 78 cases of parenchymal disease probably due to tuberculosis of the reinfective type, with 6 active cases. The cost of the survey averaged \$2.50 per teacher. A few schools are requiring instructors to be tested and x-rayed, if positive. A satisfactory program can be worked out whereby no hardship will befall instructors in our educational institutions. Naturally, there will be some opposition. Education of the benefits to be derived from such a program will have to be made. The confidence of the teachers must be obtained. Assurance that only active cases will be asked to take a leave of absence until such lesions are healed, must be given them.



The local medical society should be consulted and cooperation assured before attempting such a program. The routine tuberculin x-ray plan does not interfere with the private practice of medicine, since very few of the teachers or students would obtain the test or x-ray otherwise. Suspected and open cases would be referred to the family physician for subsequent examination, as well as other chest abnormalities which often are discovered by the routine procedure. This is a golden opportunity to educate the public. Interest will infiltrate family life, and consequently such a broadened aspect of control will aid in tuberculosis eradication.

Many schools have not considered the tuberculin-roentgenological plan because of the following objections:

1. Too expensive, or appropriations so small and budget so specific, that such a plan cannot be instituted.
2. Lack of accuracy in x-ray diagnosis.
3. Incidence of tuberculosis too small to warrant such routine procedure.
4. Undesirable psychological effect of a positive reaction upon the student.
5. Lack of cooperation of the student body and faculty.
6. Unpleasantness of the injection method for the tuberculin test.

The cost of operation is a big factor in the routine scheme proposed. This has been the greatest obstacle in preventing the wide-spread use of this means of early diagnosis. If the average of the positive reactors from various sources be taken, that is approximately 30%, a saving of about 70% in the costs of films can be made, since the negative reactors, with few exceptions, need not be x-rayed. Consequently, unless there is a surplus of money available, it would be unwise to consider a plan of x-raying all students. According to Lees<sup>28</sup>, students at the U. of Pennsylvania were given appointments at the rate of 10 every five minutes for x-ray. In 11 hours, 1,086 students were x-rayed. The total cost for the entire group was only \$814.50. Not only will the combination of the test and x-ray reduce the cost of the program, but it will reveal important information not obtained by either procedure alone. I wish to emphasize that the tuberculin test will discover infection before any infiltration is great enough to cast x-ray shadows. Since the roentgen-ray can be valuable in determining the extent of infection, the pro-

gression of the disease and the prognosis, it must be instituted for all positive reactors. It is true that the tuberculin test requires more time on the part of the physician, yet the added information obtained, certainly makes the procedure worth while.

X-ray does not always prove to be an absolute foolproof diagnostic agent in tuberculosis. Naturally, there will be borderline cases. Probably the greatest difficulty arising is whether or not an old lesion which is present might be smouldering, or entirely quiescent. This can be definitely determined after serial x-ray examinations and comparison at intervals. When we look upon our laboratory methods of diagnosis for various other diseases, we find fallacies. Many negative findings are uncertain and doubtful, such as the Wassermann, blood culture, sputum tests, etc., which have far less significance if negative, but are of great importance if positive. Several to many repetitions are frequently necessary to arrive at a correct diagnosis. Why, then, should so valuable an agency as the x-ray, which is far more accurate than the above tests, be condemned?

That the incidence of active tuberculosis cases found in our schools is too small to warrant such a procedure, is certainly open to criticism. The Committee of Tuberculosis of the American Student Health Association indicates that 10 times as many cases have been found in colleges where active control programs are in operation, than where little is being done about the problem. Previously, it has been brought out in this discussion, there is danger of overlooking active cases . . . the physical findings are many times absent or so obscure as to prevent discovery. How many of these cases are being overlooked? Our institutions will never know until they have kept abreast the march of science and have provided modern means of discovering the early cases. Even if only a few cases are uncovered annually, surely, from an economical point of view, such a program should be carried out. It will protect the student and the general populace. If one looks only at the immediate results, perhaps the program appears expensive, but it will pay the individual, the community, state and federal government, a great rate of interest on the investment in the following years.

The psychological effect of a positive reaction should cause no undue alarm to the student. It

is the duty of the physician to interpret the meaning of a positive reaction to the student and his parents. If this is done wisely, all fear should be removed. With the x-ray follow-up, there should leave little doubt in the mind of the student about his physical condition. If the x-ray confirms tuberculous activity, that student has been given a good chance to regulate his life in accordance with the advice of his physician.

There are practically no untoward effects from the tuberculin test. Statistics collected from the questionnaires sent to schools show that it almost never occurs. Myers has never seen a case where tuberculosis has been aggravated by the test. Formerly, when the stronger O. T. material, one tenth to one mgm. was used, severe local reactions occurred frequently. In most cases, when the weaker solution failed to cause a response and the stronger was used, the production of general malaise, fever, adenitis and slough were markedly reduced. Long, Aronson, and Seibert<sup>37</sup> have shown definitely that the new Purified Protein Derivative, a tuberculoprotein, is far superior to the O.T. used in the skin test. The most satisfactory dose is .00002 mgm. For those who fail to react to this dose, a second dose of .005 mgm. is used. No severe reactions occur with this material. The P.P.D. is rapidly replacing O.T., for it can be uniformly standardized and is efficient in amounts small enough not to cause objectionable symptoms.

Another objection which has arisen, is the lack of cooperation of the students. Lyght, in a personal communication, states that only two or three objectors to the test occurs in a group of 3500 at the U. of Wisconsin. Soper and Wilson<sup>25</sup> encountered very little difficulty in this regard. The opposition has been so small at Berea College that all tuberculin testing has been made voluntary. Most schools x-ray such objectors as though known to be positive reactors.

A few persons refuse the tuberculin test because of the fear of the injection method. Wolff's<sup>38</sup> tuberculin-ointment tape test can be applied to the skin, thus removing all psychic disturbances of the intracutaneous method of administration.

The application of the tuberculin test in conjunction with the x-ray will give us other important information. The incidence of the disease by sex, especially at the college level, can be determined. If it is given at intervals during

the life of an individual from an early period, it can be accurately determined just at what time a person becomes infected with tuberculosis, and therefore, a study of the actual development of the disease in all its aspects can be made. It would open to research vast fields for investigating the value of any test to determine the activity of tuberculosis or any therapeutic measures which would halt the progress of the disease. The procedure would materially aid in the determination of the damage rendered by necessary exposure to this malady. The effect of strenuous athletics upon the incidence of tuberculosis can be recorded. The incidence among students who are self-supporting by other work than school, to help defray expenses, can be estimated with a fair degree of accuracy. The relationship of upper respiratory infections to tuberculosis can be systematically studied. The relationship of the presence of calcifications and subsequent disease can be made. The relationship between the childhood and adult type of tuberculosis at the college age can be more accurately studied.

#### SUMMARY

1. The tuberculin test is of great value in determining the presence or absence of tuberculous infection, and should be a part of every routine physical examination in our educational institutions.

2. Since the technic of tuberculin administration by the two dose method with P.P.D. has been employed, severe reactions almost never occur.

3. A positive reacting person should have the benefit of a periodic examination, including x-ray, to determine the presence or absence of any tuberculous activity, for history taking and physical examinations often fail to reveal any manifest tuberculous processes.

4. Personal communications have been received from 210 colleges and universities. Thirty of these carry out a tuberculin x-ray program on all freshmen and new students. Twenty-nine institutions have a voluntary plan. Fifteen schools use only the x-ray on freshmen and new students as a check for tuberculosis. Thirteen schools are beginning the tuberculin x-ray plan, or expecting to do so in the near future.

5. Statistics reveal that a higher incidence of positive reactions occur among students from the more thickly populated communities. A greater percentage of students from the professional



schools become positive, than do undergraduates and non-professional students.

6. The routine tuberculin x-ray procedure in our educational institutions will mean an earlier diagnosis in many cases sufficiently great enough to merit the trouble and expense required to carry out such a program. It is definitely known that tuberculosis is an exceedingly important problem from the ages of 15 to 44, as indicated by the death rate, and especially during the adolescent and early maturity period.

7. The faculty and other employees should be included in the routine tuberculin x-ray program. Open cases spread the infection to the students. Education of the benefits of such preventive measures will infiltrate family life and aid materially in the eradication of the disease.

8. The program must have the cooperation of the local medical society to be effective and it should not interfere with the private practice of medicine if properly organized.

9. Such a tuberculosis program must be carried on without excessive financial burden to any individual. This can be done by group examination. Very few persons will stand the expense of such a routine unless there are sufficient symptoms present to warrant it. The expense of x-ray equipment, especially in the smaller communities, has made it prohibitive for many physicians to carry out this program. Institutions supported by local or state taxation are in the best position to proceed with such a public health program. The suspected and open cases, and other chest abnormalities should be referred to the family physician for subsequent examination and care.

10. The objections to the tuberculin x-ray program have been discussed.

11. The physician should be suspicious of any acute or chronic vague illness that is brought to his attention. Many times we need all the laboratory agencies as an aid in establishing a diagnosis of early pulmonary tuberculosis. Keeping tuberculosis foremost in our minds, careful history taking and physical examination, repeated sputum tests, tuberculin testing, roentgenographic studies, guinea pig inoculation and blood sedimentation rates are means that may be used to rule out definitely or substantiate this type of pulmonary infection.

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## Society Proceedings

### GREENE COUNTY

The regular meeting of the Greene County Medical Society was held in Carrollton, March 12, 1937. After a chicken dinner, the meeting was called to order in the dining room of Hotel Lindsey at 8:00 P. M. by our president, Dr. C. O. Bulger. The regular order of business was dispensed with and Dr. E. Lee Dorsett, Chief Obstetrician of St. John's Hospital, St. Louis, was introduced. He spoke to us on the subject of "Post Partum Hemorrhage" and gave us a most valuable and interesting lecture, including in his lecture a discussion of the proper conduct of the third stage of labor.

Round table discussion followed lasting an hour in which every member participated and many important points and experiences were discussed. A vote of thanks was tendered Dr. E. Lee Dorsett for his splendid lecture. Dr. Robert Piper accompanied Dr. Dorsett.

A business session followed. The next meeting will be a joint meeting of the Physicians and Dentists of Greene County and will be held in White Hall, Friday evening, April 23, 1937.

Wm. H. Garrison, Secretary.

### McLEAN COUNTY

Dr. Fred H. Albee, orthopedic surgeon of New York City, will be the guest of McLean County Medical Society at the Illinois Hotel, Bloomington, on Thursday, April 15.

Doctor Albee will conduct a diagnostic clinic for orthopedic cases at the Mennonite Hospital from 2:00 to 4:00 o'clock.

A dinner in honor of Doctor Albee will be served at the Illinois Hotel at 6:30 o'clock. This will be followed by an address by Doctor Albee on "Surgical Restoration of Lever at the Top of the Femur." His lecture will be illustrated with colored motion pictures.

All physicians of Central Illinois are invited to attend this very interesting meeting. Reservations should be made with Doctor Ralph P. Peairs, Secretary McLean County Medical Society, Normal, Illinois.

## Marriages

JAMES J. COLLINS to Miss Alice Connor, both of Galena, Ill., January 4.

CORNELIUS E. KLINE, Assumption, Ill., to Miss Claracille Vodde of East St. Louis, Nov. 26, 1936.

BERNARD E. MALSTROM to Miss Opal Gordon, both of Decatur, Ill., in Canton, Nov. 19, 1936.

DIEDRICH L. OLTMAN, East Moline, Ill., to Miss Myrtle A. Kenney, Dec. 19, 1936.

JOHN C. WEST to Mrs. Elizabeth Ann Patterson, both of Batavia, Ill., in Wheaton, Dec. 23, 1936.

## Personals

Dr. William J. Pickett gave a talk on "Thyroid Surgery" before the Stephenson County Medical Society at Freeport, March 18.

Dr. James H. Hutton addressed the St. Clair Medical Society at East Moline, Ill., Thursday, March 4. Subject, "X-ray Treatment of Essential Hypertension."

Dr. Henry Schmitz presented a gynecological paper before the Marion County Medical Society at Centralia on March 18.

Dr. Frank G. Murphy gave a paper on Fractures before the Kankakee County Medical Society at Kankakee on March 11.

Dr. Charles M. McKenna was one of the speakers at the Ninth Annual Conference of the Dallas Southern Clinical Society at Dallas, Texas, March 15-17th. On one day he gave a surgical clinic.

A very interesting exhibit on bronchoscopy has been arranged for the Marshall Field & Co. window by Dr. Elmer Hagens. E. V. Mueller had furnished a very complete set of instruments used for this type of work and Dr. Hagens has mounted some of the articles which he has removed from the food and air passages of Chicago children and adults. You are invited to view this exhibit.

Dr. Louis Rudolph gave two papers on "Management of Obstetric Hemorrhage," and Dr. Clifford Grulee gave papers on "Infant Feeding" and "Prophylaxis of Contagious Disease," in the second program on obstetrics and pediatrics arranged for the DeWitt and Logan County Medical Societies, at Lincoln, Illinois, March 11.

Dr. Ralph A. Reis gave papers on "Puerperal Sepsis," and "Forceps," and Dr. A. H. Parmelee, papers on "Management of the Newborn," and "Diseases of the Newborn," in the first program of the series arranged for Sangamon County Medical Society, at Springfield, March 11.

Dr. Dean D. Lewis, Baltimore, addressed the Springfield Medical Club, Springfield, March 23,



on "Surgical Significance of Ductless Gland Lesions."

Dr. Carlo S. Scuderi, Chicago, discussed "Radiographic Interpretations of Bone Tumors" before the Stephenson County Medical Society, Freeport, February 18.

Dr. Owen H. Wangenstein, Minneapolis, discussed "Studies in the Etiology of Acute Appendicitis" before the Aux Plaines Branch of the Chicago Medical Society, February 26.

The North Shore Branch was addressed March 2 by Drs. Walter C. Alvarez, Rochester, Minn., on "Helpful Hints in the Treatment of Gastro-Intestinal Diseases" and Benjamin Goldberg, on "Bronchiectasis."

Dr. Fred M. Smith, professor and head of the department of theory and practice of medicine, State University of Iowa College of Medicine, Iowa City, spoke on left ventricular failure at a meeting of the North Side Branch, March 4.

Dr. Erward D. Churchill, John Homans professor of surgery, Harvard University Medical School, Boston, discussed "Hyperparathyroidism" before the Evanston Branch, March 4, and Dr. Richard H. Young, "The Anemias — A Physiologic Approach."

At a meeting of the Englewood Branch, March 2, Dr. Arthur E. Hertzler, professor of surgery, University of Kansas School of Medicine, Kansas City, discussed "Indications for Surgical Treatment in Toxic and Nontoxic Goiter," and Dr. Leroy H. Sloan, "Medical Management of Toxic and Nontoxic Goiter."

Dr. Max Cutler, director of the tumor clinic at Michael Reese Hospital, is spending two months at Peiping Union Medical College, Peiping, China, as visiting professor of surgery. Dr. Cutler will return May 10.

The Sangamon County Medical Society was addressed in Springfield, March 25, by Drs. Morris Edward Davis, Chicago, on "Mechanism of Normal Labor" and "Medical Complications of Pregnancy," and Joseph Greengard, Chicago, "Syphilis" and "Tuberculosis."

Dr. Elliott P. Joslin, clinical professor of medicine, Harvard University Medical School, Boston, delivered the ninth annual Stephen Walter Ranson Lecture in Thorne Hall, Northwestern University, February 3, on protamine insulin.

Dr. Leo Loeb, professor emeritus of pathology, Washington University School of Medicine, St.

Louis, presented the fourth Arno B. Luckhardt lecture, March 30, at Billings Hospital, under the auspices of the Delta chapter of Phi Beta Pi. His subject was "The Biological Basis of Individuality."

The Madison County Medical Society conferred honorary membership on Drs. Adam H. Oliver, Edwardsville; Charles R. Kiser, Madison, and Leonard Schreifels, Granite City, at a recent meeting. All are 70 years or more of age. Dr. Schreifels was president of the society in 1929 and Dr. Kiser in 1919.

Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., delivered the Gehrman Lectures at the University of Illinois College of Medicine, March 22-24. His subjects were "Health as a Factor in Social Security," "Industrial Hygiene," and "Syphilis." These lectures were scheduled for January 25-27 but were canceled on account of the flood emergency.

Dr. Lindon Seed, Chicago, discussed "The Diagnosis and Determination of Operability of Toxic Goiter" before the Peoria City Medical Society, March 8. Dr. Howard A. Rusk, St. Louis, spoke on "The Irritable Colon" at the February 8 meeting, and Dr. Irving S. Cutter, dean, Northwestern University Medical School, Chicago, "The Future of Medicine," February 15.

Dr. E. A. Skolnik, Director of the Syphilis Clinic, Rush Medical College, addressed the Jewish Physicians Fellowship Club of Chicago and Suburbs on March 8 on "A Panoramic View of Syphilis."

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## News Notes

—The Chicago Medical Society will have its headquarters in the Michigan Boulevard Building, 30 North Michigan Avenue, after April 1. The society will occupy four rooms on the fifteenth floor of the building.

—A campaign to immunize children against diphtheria was projected in eighty parochial schools in the diocese of Belleville by the school authorities and the Catholic Physicians' Guild. Children who paid no tuition were inoculated without charge, the others going to their family practitioners. The parochial school physician gave the free inoculations and supervised the program. In the future all children entering

school for the first time will have medical examinations.

—Dr. Edmund Jacobson has removed his laboratory to the 310 South Michigan Building, Chicago, where it will be known as the Laboratory for Clinical Physiology. He will continue his investigations especially on muscular, nervous and brain states in man in proximity with his medical practice. The laboratory is constructed and equipped for low voltage measurements, making it possible to record the nervous states of patients at various stages in different disorders. Co-operative studies with Chicago physicians and the training of medical students in research and in practical phases of the field of relaxation are included in the program.

—Dr. Stephen W. Ranson, professor of neurology and director of the Neurological Institute, Northwestern University Medical School, will deliver the first annual Alpha Omega Alpha Lecture April 2 in the Medical and Dental Laboratories Building of the University of Illinois College of Medicine. His subject will be "The Functional Significance of the Hypothalamus." The lectureship has been established to commemorate the thirty-fifth anniversary of the founding of Alpha Omega Alpha and will be given annually in the future. The medical fraternity, with chapters in fifty-six class A medical schools, was founded at the University of Illinois College of Medicine in 1902.

—Dr. Ludvig Hektoen delivered the first Christian Fenger Lecture of the Institute of Medicine of Chicago and the Chicago Pathological Society at a joint meeting with the Society of Medical History of Chicago and the Chicago Surgical Society, March 26. His subject was "Early Pathology in Chicago and Christian Fenger." The lectureship has recently been established under the joint auspices of the institute and the pathologic society in honor of Dr. Christian Fenger, who was the first teacher of pathology in the Middle West. He was born in Copenhagen, Denmark, Nov. 3, 1840, and died March 7, 1902. He served as professor of clinical surgery at the College of Physicians and Surgeons, Chicago Medical College and Rush Medical College.

—The Maternal Welfare Committee of the Chicago Gynecological Society has completed its

self-assigned work of securing case reports on maternal deaths in Chicago but announces that the report will not be available for some time. For 1936 a record of every maternal death in the hospital and the home was obtained. Personal interviews are being made to obtain the few that are missing for 1934 and 1935. The forms adopted by the committee, to be filled out by the hospital, were considered so satisfactory that the city board of health put them into use January 1 for recording similar information, making the report mandatory. The study was instituted in 1934 with a view to considering controllable factors in maternal mortality; it was financed by the Chicago Gynecological Society. Dr. Fred L. Adair is chairman of the maternal welfare committee, which will not be disbanded but will serve in an advisory capacity to the board of health on questions involving policy in the maternal welfare work in Chicago.

—A regulation adopted by the Illinois State Department of Health requires that dog bites and other injuries inflicted by animals on human beings be reported immediately. The regulation further requires that the circumstances surrounding each instance be investigated by the health officer or a physician designated by him to determine whether the animal concerned is rabid and whether the injured person needs antirabic treatment. Last year 5,336 persons were given antirabic treatment with vaccine supplied by the state department of public health. The heads of 877 dogs were examined in the laboratories of the department, and nine persons died of rabies in the state. The department also announces that drugs for the treatment of syphilis will be distributed free of charge in the future. Heretofore these drugs were available for indigent persons only. The change in policy was made to encourage early, adequate and efficient treatment by reducing the cost to the patient, regardless of his financial ability.

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## Deaths

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ELMER K. AVERY, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; formerly medical examiner for the John Hancock Life Insurance Company; aged 62; for many years a member of the staff of the Nor-



wegian-American Hospital, where he died, February 21, of coronary thrombosis.

EDWARD U. BANKER, Aurora, Ill.; Rush Medical College, Chicago, 1904; a Fellow, A. M. A.; on the staff of St. Charles Hospital; aged 59; died, January 10, of a malignant tumor of the colon.

SHERMAN H. CHAMPLIN, Chicago; College of Physicians and Surgeons of Chicago, 1895; on the staff of the Garfield Park Hospital; aged 71; died, January 14, of chronic myocarditis and chronic arthritis.

CLARENCE W. CHAPIN, Clinton, Ill.; Northwestern University Medical School, Chicago, 1899; member of the Illinois State Medical Society; past president of the DeWitt County Medical Society; served during the World War; on the staff of the Dr. John Warner Hospital; aged 64; died, January 21, at St. Joseph's Hospital, Bloomington, of coronary thrombosis.

LEO ALEXANDER CHRZANOWSKI, Joliet, Ill.; Loyola University School of Medicine, Chicago, 1933; member of the Illinois State Medical Society; aged 30; died, January 21, in St. Joseph's Hospital, of duodenal ulcer and secondary hemorrhage.

ORVAL MELCHER DICKERSON, Cairo, Ill.; Jefferson Medical College of Philadelphia, 1910; member of the Illinois State Medical Society; past president of the Alexander County Medical Society; on the staff of St. Mary's Hospital; at one time county coroner; formerly district health officer of Alexander, Pulaski and Union counties; aged 55; died suddenly, January 18, of angina pectoris.

NEILL JOHN DOHERTY, Crystal Lake, Ill.; Loyola University School of Medicine, Chicago, 1933; a Fellow, A. M. A.; aged 40; died, Dec. 9, 1936, in the Hospital of St. Anthony de Padua, Chicago, of hypertension, chronic nephritis and cardiac dilatation.

JUDSON IRWIN DOSS, Milton, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1880; member of the Illinois State Medical Society; aged 78; died in December, 1936, of uremia and nephritis.

GEORGE LOUGHEAD EYSTER, Coral Gables, Fla.; University of Pennsylvania Department of Medicine, Philadelphia, 1874; member of the Illinois State Medical Society; during the World War served as chairman of the draft board and chairman of the Red Cross Chapter in Rock Island, Ill.; one of the founders and Fellow of the American College of Surgeons; formerly on the staff of St. Anthony's Hospital, Rock Island; aged 83; died, January 11, of uremia, obstruction of the right ureter and pyonephrosis.

GEORGE WILLARD GREEN, Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; a Fellow, A. M. A.; Fellow of the American College of Surgeons; member of the Institute of Medicine of Chicago and the American Association of Railway surgeons; aged 74; one of the founders and on the staff of the Ravenswood Hospital, where he died, January 24, of coronary occlusion and arteriosclerosis.

ROBERT HARDIE, Chicago; Rush Medical College, Chicago, 1901; aged 59; on the staff of the Hospital of St. Anthony de Padua, where he died, January 23, of coronary occlusion.

A. RALPH JOHNSTONE, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1887; aged 71; died, January 24, of uremia and malignancy of the bladder.

ALBERT CHESTER KEENER, Altona, Ill.; Northwestern University Medical School, Chicago, 1910; past president of the Knox County Medical Society; aged 63; died, January 10, in St. Mary's Hospital, Galesburg, of injuries received in a fall.

CHARLES ELDER LINDSAY, Chicago; University of Illinois College of Medicine, Chicago, 1914; served during the World War; on the staff of the Illinois Central Hospital; aged 49; died, January 22, of influenza, bronchopneumonia, cerebral hemorrhage and mitral stenosis.

EDWARD LUEHR, Chicago; Rush Medical College, Chicago, 1892; an Affiliate Fellow of the American Medical Association; aged 73; on the staff of the South Chicago Community Hospital, where he died, January 31, of coronary thrombosis.

WILLIAM PATTERSON MACCRACKEN, Chicago; Hahnemann Medical College and Hospital, Chicago, 1887; formerly senior medical examiner for the aeronautics branch of the U. S. Department of Commerce; aged 73; died, January 31, of chronic myocarditis and arteriosclerosis.

WILMER WEIR McGRATH, Savannah, Ill.; Central Medical College of St. Joseph, Mo.; 1896; a Fellow, A. M. A.; formerly mayor; past president of the Carroll County Medical Society; on the staff of the Savannah City Hospital; aged 67; was found dead, January 9, of injuries and exposure due to a fall on an icy road while going for assistance after his car stalled.

JAMES EDWARD MCINTYRE, Tremont, Ill.; (licensed in Illinois in 1891); a Fellow, A. M. A.; formerly bank president, mayor, president of the high school board and county physician; aged 75; died, January 14, in the Methodist Hospital, Peoria, of lobar pneumonia.

JOHN ALOYSIUS PARKER, Chicago; Loyola University School of Medicine, Chicago, 1922; a Fellow, A. M. A.; vice president and on the staff of St. Bernard's Hospital; on the visiting staff of the Evangelical Hospital; aged 42; died, January 16, of acute endocarditis and mesenteric thrombosis.

RALPH S. PIPER, Chicago; Hahnemann Medical College and Hospital, Chicago, 1900; aged 59; died, January 10, in the Chicago Memorial Hospital, of peritonitis due to a perforated duodenal ulcer.

WILLIAM RIGHTMAN, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; on the associate staff of the Frances E. Willard Hospital; aged 61; died, January 19, of coronary thrombosis.

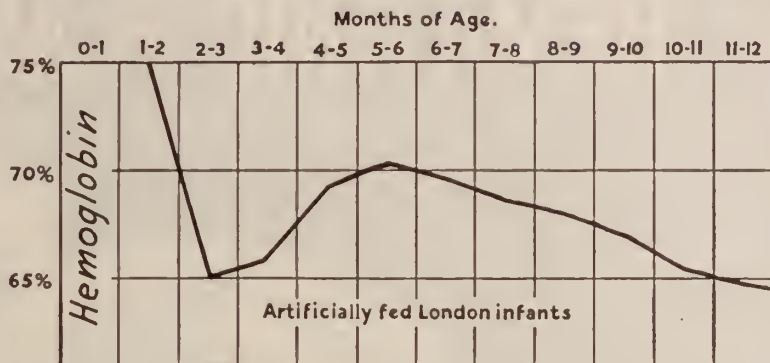
MARGUERITE GILHAM SQUIRE, Carrollton, Ill.; Homeopathic Medical College of Missouri, St. Louis, 1894; county physician; aged 71; died, January 7, of cerebral thrombosis, hypertension and myocarditis.

SAMUEL HALL WILCOX, Carlyle, Ill.; Missouri Medical College, St. Louis, 1890; aged 70; died, Dec. 21, 1936, of cerebral hemorrhage.

# Nutritional Anemia in Infants

The accompanying chart of the hemoglobin level in the blood of infants is based on more than 1,000 clinical cases studied by Mackay. The sharp drop in hemoglobin during the early months of life has also been reported by a number of other authorities. It is noteworthy that this fall in hemoglobin has been found to parallel closely that of diminishing iron reserve in the infant's liver. The usual milk formula of infants in early life further contributes to this anemia because milk is notably low in iron. It is now possible, however, to increase significantly the iron intake of bottle-fed infants from birth by feeding Dextri-Maltose With Vitamin B in the milk formula.

After the third month Pablum as the first solid food offers substantial amounts of iron for both breast- and bottle-fed babies.



## Reasons for Early Pablum Feedings

1. The iron stored in the infant's liver at birth is rapidly depleted during the first months of life. (Mackay,<sup>1</sup> Elvehjem.<sup>2</sup>)
2. During this period the infant's diet contains very little iron—1.44 mg. per day from the average bottle formulae of 20 ounces, or possibly 1.7 mg. per day from 28 ounces of breast milk. (Holt.<sup>3</sup>)

For these reasons, and also because of the low hemoglobin values so frequent among pregnant and nursing mothers (Coons,<sup>4</sup> Galloway<sup>5</sup>), the pediatric trend is constantly toward the addition of iron-containing foods at an earlier age, as early as the third or fourth month. (Blatt,<sup>6</sup> Glazier,<sup>7</sup> Lynch<sup>8</sup>.)

## The Choice of the Iron-Containing Food

1. Many foods reputed to be high in iron actually add very few milligrams to the diet because much of the iron is lost in cooking or because the amount fed is necessarily small or because the food has a high percentage of water. Strained spinach, for instance, contains only 1 to 1.4 mg. of iron per 100 gm. (Bridges.<sup>9</sup>)
2. To be effective, food iron should be in soluble form. Some foods fairly high in total iron are low in soluble iron. (Summerfeldt.<sup>10</sup>)
3. Pablum is high both in total iron (30 mg. per 100 gm.) and soluble iron (7.8 mg. per 100 gm.) and can be fed in significant amounts without digestive upsets as early as the third month, before the initial store of iron in the liver is depleted. Pablum also forms an iron-valuable addition to the diet of pregnant and nursing mothers.

Pablum (Mead's Cereal thoroughly cooked and dried) consists of wheatmeal, oatmeal, cornmeal, wheat embryo, brewers' yeast, alfalfa leaf, beef bone, iron salt and sodium chloride.

<sup>1-10</sup> Bibliography on request.

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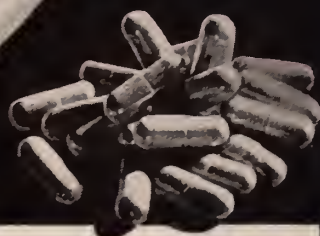
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## BUYERS INDEX

### ABDOMINAL SUPPORTERS

Storm, Katherine L., M. D., 1701 Diamond St., Philadelphia, Pa. . . . .

### FOODS

Coca-Cola Co., Atlanta, Ga. . . . . 34  
 Corn Products Refining Co., New York City. . . . . 4  
 R. B. Davis Co., Hoboken, N. J. . . . . 33  
 H. J. Heinz, Pittsburgh. . . . . 18  
 Knox Gelatine Laboratories, Johnstown, N. Y. . . . . 25  
 Kraft-Phenix Cheese Corp., Chicago . . . . . 11-13  
 Mead Johnson & Co., Evansville, Ind. . . . . 21  
 Nutritious, Inc., Beverly Hills, Cal. . . . . 33  
 Ralston Purina Co., St. Louis, Mo. . . . . 15  
 S. M. A. Corporation, Cleveland . . . . . 2  
 The Wander Company, 180 N. Michigan Ave., Chicago. . . 14

### FINANCIAL AND INSURANCE

Medical Protective Co., Fort Wayne, Ind. . . . . 8  
 Physicians Casualty Co., Omaha, Neb. . . . . 35

### HOSPITALS

Stokes Hospital, Louisville, Ky. . . . . 35

### PHARMACEUTICALS

American Agency, French Vichy, Brooklyn, N. Y. . . . . 29  
 American Can Co., 230 Park Ave., New York City. . . . . 3  
 Arlington Chemical Co., Yonkers, N. Y. . . . . 31  
 Armour & Co., Chicago. . . . . 24  
 Bovinine Company, Chicago. . . . . 22  
 Bristol-Myers Co., New York. . . . .  
 Carnrick, G. W., Co., 411 Canal St., New York City. . . . 19  
 Carr Drug Co., Muncie, Ind. . . . . 30  
 Ciba Company, Cedar and Washington St., New York City 38  
 Denver Chemical Co. . . . . 26  
 Gold Pharmacal Co., New York City. . . . . 35  
 Harrower Laboratory . . . . . 37  
 Hoffman-LaRoche, Inc., Nutley, N. J. . . . . 7  
 Hynson, Westcott & Dunning, Charles and Chase Sts., Baltimore . . . . . 35  
 Lilly, Eli & Co., Indianapolis, Ind. . . . . 20  
 Merck & Co., Rahway, N. J. . . . . 16

Wm. S. Merrell Co., Cincinnati. . . . .  
 Merrell, Wm. S., Co., Cincinnati. . . . .  
 Morris, Philip, & Co., 19 Fifth Ave., New York. . . . . 8  
 Parke, Davis & Co., Detroit, Mich. . . . . 5  
 Petrolagar Laboratories, 8134 McCormick Blvd., Chicago . . . . . opp. p. 8  
 Pharmaceutical Specialties Co., Chicago. . . . . opp. p. 24  
 Rare Chemicals, Nepera Park, N. Y. . . . . 9  
 Reed & Carnrick, Jersey City, N. J. . . . . 32  
 Schering & Glatz, Inc., New York City. . . . .  
 G. D. Searle & Co., 4737 Ravenswood Ave., Chicago. . . . .  
 Sharp & Dohme, 41 John St., New York City. . . . . 19  
 E. R. Squibb & Sons, New York. . . . . 39  
 Frederick Stearns & Co. . . . . 6  
 Tilden Company, New Lebanon, N. Y. . . . . 30  
 U. S. Standard Products Co., Woodworth, Wis. . . . . 28  
 Wm. R. Warner & Co., 113 W. 118th St., New York City. 11, 17  
 Winthrop Chemical Co., 170 Varick St., New York City. . .

### SANATORIA AND SANITARIA

Edward Sanatorium, Naperville, Ill. . . . . 36  
 Elmlawn (Wilgus) Sanitarium, Rockford, Ill. . . . . 27  
 Kenilworth Sanitarium, Kenilworth, Ill. . . . . 27  
 Michell Farm Sanitarium, Peoria, Ill. . . . . 40  
 Milwaukee Sanitarium, Wauwatosa, Wis. . . . . Front Cover  
 Norbury Sanitarium, Jacksonville, Ill. . . . . 27  
 North Shore Health Resort, Winnetka, Ill. . . . . 36  
 Rogers Memorial Sanitarium, Oconomowoc, Wis. . . . . 40  
 Waukesha Springs Sanitarium, Waukesha, Wis. . . . . 27  
 Weirick's Sanitarium, Elgin, Ill. . . . . 35

### RADIUM

Physicians Radium Assn., 55 E. Washington St., Chicago. . 35  
 Radium and Radon Corp., 25 E. Washington St., Chicago. . 37

### SCHOOLS

Pogue School, Wheaton, Ill. . . . . 38

### SURGERY INSTRUCTION

A. V. Partipilo, M. D., 1950 S. Ogden Ave. . . . . 28

### SURGICAL SUPPLIES

W. A. Baum Co., New York. . . . . 28  
 General Electric X-ray Corp., 2012 Jackson Blvd., Chicago



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### 1926

1. Boissevain, C. H.—*The Action of Unsaturated Fatty Acids on Tubercle Bacilli.*

Boissevain reports experiments showing the effect of unsaturated fatty acids on the virulence of tubercle bacilli in vitro. (Compare with the work of Larson on the ricinoleates) Linoleic and linolenic acids were among the most effective.

(*American Review of Tuberculosis*, volume 13, pages 84-89, 1926.)

### 1927

2. Evans, H. M., and Burr, G. O.—*New Dietary Deficiency with Highly Purified Diets.*

Diets freed from fat but containing adequate amounts of vitamin A, B, D, and E proved incapable of maintaining normal growth and reproduction in animals. The authors conclude that such purified diets demand either an extraordinary and unique amount of some one of the known vitamins or else another and unknown member (F or II) of the vitamin class.

(*Proceedings of the Society of Experimental Biology and Medicine*, volume 25, pages 41-48, 1927.)

3. Evans, H. M., and Burr, G. O.—*New Dietary Deficiency with Highly Purified Diets; The Biological Effect of Fat in the Diet.*

Fat improved growth and ovulation in a study of animals fed a fat free diet. When the fats were separated into non-saponifiable matter, glycerol and fatty acids, the improvement was attributed to the fatty acid fraction. The authors considered the favorable substance in fat as representing possibly a new vitamin (F), which, unlike vitamins A, D, and E, is not concentrated in the non-saponifiable fraction.

(*Proceedings of the Society of Experimental Biology and Medicine*, volume 25, pages 390-397, 1927.)

### 1928

4. Evans, H. M., and Lepkovsky, S.—*Sparing Action of Fat on the Anti-Neuritic Vitamin.*

If fat is added to a fat free diet, the amount of anti-neuritic vitamin necessary to establish any definite level of growth or frequency of ovulation is always less than is required when fat is absent. The action of vitamins A, D, and E was excluded, nor was there any anti-neuritic vitamin in the fats themselves. The authors conclude that the action is due to the biological effect of fats previously emphasized by Evans and Burr; therefore, due to vitamin F.

(*Science*, volume 68, page 298, 1928.)

5. Archard, C., Grigaut, A., LeBlanc, A., and David, M.—*L'Equilibre Lipoidique du Sérum Sanguin dans les*

*Maladies Aigües (The Lipoid Equilibrium of the Blood Serum in Acute Diseases).*

Archard and his associates studied the lipoids of the blood serum, including the iodine number (unsaturated fats) in various diseases. The iodine number is definitely lowered in the acute stage of disease, beginning to rise when convalescence begins and gradually approaching normal as the patient recovers. In fatal cases the iodine number showed no increase. They concluded that the diminution in the iodine number, or in the unsaturated fats, corresponds with a diminution of the defensive powers of the organism against invasion. (Compare Boissevain and Larson.)

(*Journal de Physiologie et de Pathologie Generale*, volume 26, page 415, 1928.)

### 1929

6. McAmis, A. J., Anderson, W. E., Mendel, L. B.—*Growth of Rats on Fat Free Diets.*

During the life of animals grown on fat free diets, the authors noted a poor condition of the fur and bloody urine. Other symptoms suggestive of vitamin deficiency were observed. The authors concluded that, whether the apparent beneficial effects of a small amount of fat is due to its content of vitamin A or other vitamins, or to its action as a vehicle for the fat soluble vitamins, or whether fat per se is essential, had not been conclusively demonstrated by their own experiments.

(*Journal of Biological Chemistry*, volume 82, page 247, 1929.)

7. Burr, G. O., and Burr, M. M.—*A New Deficiency Disease Produced by the Rigid Exclusion of Fat From the Diet.*

The first minute description of a fat deficiency syndrome appears in this contribution. Fat deficiency makes for retarded growth, more marked in the male than in the female animal. An abnormal scaly condition of the skin is developed. Hemorrhagic spots appear throughout the entire length of the tail and an actual necrosis results. The hind feet become red and swollen. The hair is filled with dandruff and a tendency for its loss is apparent. Sores appear in the skin, especially the skin of the face. The urinary tract and kidney is extensively involved and undoubtedly is an important factor in the death of the animal.

The presence of fatty acids in the diet changed the entire economy of the animals. If the effect be not due to ordinary fatty acids, the authors suggest that a new substance of the nature of an ether soluble organic acid, which could be classed as a vitamin, was responsible for this characteristic dietary deficiency (vitamin F).

(*Journal of Biological Chemistry*, volume 82, pages 345-367, 1929.)

8. Evans, H. M., and Lepkovsky, S.—*Sparing Action of Fat on the Anti-Neuritic Vitamin (B).*



The authors refer to their work of 1928 which is amplified in this report. They conclude that, in the absence of anti-neuritic vitamin B, it takes relatively more fat to bring into evidence the sparing action of fat. They defend the view that fats as such undoubtedly exert an important function in the metabolism of the animal other than supplying energy.

(*Journal of Biological Chemistry*, volume 83, pages 269-287, 1929.)

9. Brown, J. B.—*The Occurrence of a New Highly Unsaturated Fatty Acid in the Lipids of the Brain.*

Brown reports the finding of unsaturated lipids in beef brain.

(*Journal of Biological Chemistry*, volume 83, pages 783-791, 1929.)

10. Brown, J. B., and Rawlins, A. L.—*The Effect of Feeding Whale Oil on the Depot Fat of the White Rat.*

An equilibrium between the food fat and the depot fat was established in between four to six weeks on a given diet. The characteristic wholly unsaturated fatty acids of whale oil were apparently deposited as such.

(*Proceedings of the Society of Experimental Biology and Medicine*, volume 26, page 704, 1929.)

11. Taylor, T. C., and Iddles, H. A.—*Separation of the Amyloses in Some Common Starches.*

Corn starch contained 1.18 per cent of fatty material with iodine numbers of from 90.6 to 91.2 in different samples. Investigators using starch in a basic diet, in the belief that it is fat free, might readily overlook this residuum of highly unsaturated fats, against which error Taylor and Iddles caution.

(*Industrial and Engineering Chemistry*, volume 18, pages 713-717, 1929.)

## 1930

12. Sinclair, R. G.—*The Influence of Diet on the Amount and Composition of the Phospholipid Fatty Acids in Various Tissues in the Cat.*

Sinclair observed that the degree of unsaturation of the fatty acids was definitely higher in the liver, heart, kidney, smooth and skeletal muscles, and intestinal mucosa in cats fed with beef kidney than in cats fed with beef muscle.

(*Journal of Biological Chemistry*, volume 86, pages 579-586, 1930.)

13. Burr, G. O., and Burr, M. M.—*On the Nature and Role of the Fatty Acids Essential in Nutrition.*

The most sensitive test of fat deficiency disease is scaliness of the feet. Dandruff is also a reliable indication of the disease. Still greater emphasis is placed on the condition of the kidneys, which are grossly abnormal and show a degeneration, unlike that ascribed to vitamin A deficiency. The kidney disorder due to fat deficiency disease is neither cured nor prevented by increased amounts of the A and D fraction from cod liver oil, but is cured or prevented by the addition of fatty acid not containing vitamin A.

Disturbance of the pituitary is evidenced by the abnormal consumption of water that fat deficient rats display. Vitamin E was without effect in the prevention or cure of the fat deficiency syndrome, nor was regular ovulation induced in female animals by the addition of vitamin F, as was the case with curative oils.

Infertility arising from fat deficiency is not corrected with vitamin E. The fat deficiency syndrome in its entirety was not cured by saturated fatty acids, including stearic, palmitic, myristic, lauric or lower members of the aliphatic series; but it was cured by linoleic acid, either alone or when present in olive oil, lard, corn oil, poppy seed oil, or linseed oil.

The evidence seemed to point to the great effectiveness of linoleic acid, which the authors consider an indispensable essential fatty acid for nutrition. This is the first evidence that suggests the nature of the vitamin F material hinted at in all previous work.

(*Journal of Biological Chemistry*, volume 86, pages 587-621, 1930.)

14. Brown, J. B., and Ault, J. C.—*Comparison of the Highly Unsaturated Acids of Beef, Hog, and Sheep Brains.*

A method is described for the isolation of the fatty acids of the brain. This method may become useful for future work on vitamin F.

(*Journal of Biological Chemistry*, volume 89, pages 167-171, 1930.)

15. Platonov, G.—*The Influence of Unsaturated Fatty Acids on the Virulence of Tubercle Bacilli.*

Platonov points to recent investigations as having proved the extreme biological importance of lipoids, especially those of the unsaturated fatty acid type. The value of these substances "as nourishment" for the tuberculous patient is thought by Platonov to have been clearly demonstrated during the World War, when the spread of tuberculosis and the peculiar character of the disease at that time furnished proof of diminished resistance brought about by hunger and especially by an insufficiency of fats.

Platonov refers to the work of Goldenberg and Steffso (Russian reference not available) whose determination of the iodine value of various tissues indicated a decrease of the content of unsaturated fatty acid in the organs of the tuberculous and the underfed. Goldenberg and Steffso regard this as the reason for an increased susceptibility for tuberculosis.

Platonov seems to have demonstrated an increased immunity to otherwise lethal doses of tubercle bacilli in guinea pigs by the effect of various oils containing unsaturated fatty acids on tubercle bacilli.

Clinically, the author indicates that his experience is such as to support the conviction that the tubercle bacillus does not easily attack tissues in the human in which unsaturated fatty acids are richly contained. He indicates that the high content of oleins in horse serum and the presence in it of highly unsaturated linoleic acid fits admirably well with the known immunity of the horse to tuberculosis. Platonov indicates that the unsaturated fatty acids should serve as a basis for the dietetic therapy of tuberculosis.

(*American Review of Tuberculosis*, volume 21, pages 362-369, 1930.)

16. Mueller, P.—*Ueber die Ungesättigten Fettsäuren Menschlichen Lebers (Unsaturated Fatty Acids of the Human Liver).*

In human livers, Mueller found that the quantity of unsaturated fatty acids did not increase proportionately with the total fat content of the liver, but remained essentially the same for the total liver substance.

(*Archiv für Experimentelle Pathologie und Pharmakologie*, volume 147, pages 219-235; and 240, 1930.)

17. Sinclair, R. G. — *Some observations on the Growth of Rats on Fat Free and Fat Containing Diets.*

Sinclair reports that rats fed on the fat free diet similar to that used by Burr and Burr developed a scaly condition of the tail without exception and identical with that described by Burr and Burr, if they were kept in cages with a false bottom. The matter of access to feeding on feces is developed.

Cod liver oil did not protect against scaliness of the tail, even when used up to 10 per cent by weight of the diet.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 27, pages 1039-1062, 1930.)

## 1931

18. Graham, C. E., and Griffith, A. H. — *Observations on the Nutritive Value of Certain Fats.*

These investigators corroborated the findings of the Burrs. The scaliness that developed on the feet was not prevented by doubling the yeast intake nor by an active extract of rice polishings, nor by an active liver extract. The condition of the tail was made worse by increasing the cod liver oil. The symptoms were prevented by wheat germ oil, lard or whole liver, wheat germ oil being the most effective, and lard the least effective.

Graham and Griffith required additional information before accepting the Burr fat deficiency signs as representing a deficiency in some food factor or as a toxic effect due to the cod liver oil used.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 28, pages 756-761, 1931.)

19. Funk, Casimir, Caspe, S., Caspe, H. — *A New Pathological Condition of Probable Dietetic Origin in Rats.*

These authors report a syndrome analogous to that described by Burr which they could not prevent by the addition of lard or cod liver oil or linoleic acid to the daily ration. The error in this investigation is discussed subsequently by Burr.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 28, pages 816-818, 1931.)

20. Sueyoshi, Y., and Furukubo, T. — *Ueber die Fettsäuren des Eigelblecithins (On the Unsaturated Fatty Acids in Egg Yolk Lecithin).*

Egg yolk lecithin was found to contain 73.2 per cent. of oleic acid, 5.1 per cent. of clupadonic acid and 2.1 per cent. of linoleic acid. Previous to this investigation clupadonic acid had been found only in fish oils.

(*Journal of Biochemistry*, volume 13, pages 177-183, 1931.)

21. Hume, E. M., and Smith, H. H. — *Relation of Fat Free Diet to the Scaly Tail Condition in Rats Described by Burr and Burr.*

These authors observed the development of the tail condition in rats which received fats in the diet as well as those that did not receive fats. Chick, Roscoe and Aykroyd observe a similar scaly condition in their rats at the Lister Institute, when the animals were housed in cages with coarse wire flooring and diets supplemented by yeast derivatives, rather than whole yeast, as the source of the B vitamins.

(*Biochemical Journal*, volume 25, pages 300-306, 1931.)

22. Brown, J. B. — *Content and Nature of the Highly Unsaturated Fatty Acids of the Human Brain.*

Fresh and preserved specimens of human brain showed unsaturated fatty acid content not essen-

tially different from that in the various animal brains examined.

(*Journal of Biological Chemistry*, volume 92, pages LXXXVII-LXXXIX, 1931.)

23. Klenke, E., and v. Schoenebeck, O. — *Über die hochungesättigten Fettsäuren des Phosphatide aus verschiedenen Organen (Highly Unsaturated Fatty Acids from the Phosphatides in Various Organs).*

This study corroborates the findings many times elsewhere reported that unsaturated fatty acids occur in phosphatides of many animal organs.

(*Zeitschrift für Physiologische Chemie*, volume 151, pages 191-192, 1931.)

24. Cornbleet, T. — *Use of Maize Oil (Unsaturated Fatty Acids in the Treatment of Eczema).*

Cornbleet notes that over a period of four and a half years a group of eighty-seven patients with chronic eczema responded to treatment with maize oil given by mouth.

The eczema in the cases studied was the condition referred to as allergic eczema, exudative and dietetic eczema, Besnier's prurigo or generalized neurodermatitis.

All of the patients were over five years of age, most of them adolescents and young adults. All of them had been treated for eczema for several successive years and many since infancy. The use of the oil was not begun until it was established that the patients did not recover easily on any standard therapy.

The first notable improvement was a lightening of the color of the skin. Then the thickened parts became thinner and more supple. Itching was sometimes relieved early. The face was usually the first to improve, the hands and the feet the last.

A few of the patients had asthma which was improved as well as the eczema. Cornbleet refers to the findings of Burr and of Hansen who describes the action of the oil in eczema as being due probably to its high content of unsaturated fatty acids.

(*Archives of Dermatology and Syphilology*, volume 31, pages 224-226, 1931.)

25. Maronne, P. A. — *Contribution à l'Etude du Métabolisme Normal et Pathologique des Graisses (A Contribution to the Study of the Normal and Pathologic Metabolism of the Fats).*

Maronne summarizes the experiences of French investigators as having shown that the unsaturated fatty acids are more advantageous to the development of the organism than are the saturated fatty acids. He ascribes the protective function of fats in the subcutaneous tissue to their degree of unsaturation. He points out that, whereas the liver plays an important part in the metabolism and fixation of fats in the organism, recent researches indicate that the lungs, the spleen and the subcutaneous tissue also have a part in this metabolism.

The author opines that obesity is due chiefly to the inability to desaturate the fats assimilated in order that they may be utilized by the organism. He suggests that in the treatment of obesity saturated fats be replaced with unsaturated oils.

(*Paris, Thesis.*)

## 1932

26. Gregory, E., and Drummond, J. C. — *A Study of Fat Metabolism with Special Reference to Nutrition on Diets Devoid of Fat.*

These authors report experiments in which a poor condition of the fur and a scaly tail developed on fat free diets. The symptoms were not relieved by the addition of fats containing unsaturated fatty acids but were relieved by the intake of vitamin B.



Their analysis showed that linoleic acid deposited in the adipose tissue of the body is probably derived from the food.

(*Zeitschrift für Vitaminforschung*, volume 1, pages 257-284, 1932.)

27. Hotta, S.—*Die Bedeutung der Hochungesättigten Fettsäuren in den Organen* (The Significance of the Highly Unsaturated Fatty Acids in the Organism).

The administration of thyroxin increases the oxidation of the fatty acids in the body, but there is no formation of the highly unsaturated fatty acids.

Less highly unsaturated fatty acids are more easily metabolized than are highly unsaturated fatty acids.

(*Tohoku Journal of Experimental Medicine*, volume 20, pages 65-78, 1932.)

28. Roche, A., Roche, J.—*Sur les Accidents Cutanés Attribués à la Carence en Lipide chez le Rat* (Cutaneous Eruptions Attributed to Deficiency of Lipid in the Rat).

In two types of diet containing butter fat, rats developed ulceration of the paws and a necrosis of the tail, even when yeast extract was added to the diet, but did not develop these symptoms if fresh yeast was given instead.

(*Comptes Rendus de la Société Biologique*, volume 109, pages 463-464, 1932.)

29. Sinclair, R. G.—*The Relationship Between the Amount of Fat Ingested and the Degree of Unsaturation of the Phospholipids and the Neutral Fat in the Tissues of the Rat.*

Continuing his experiments on the effective fat in the diet, Sinclair suggests that the decline and death of rats on a fat free diet as reported by Burr and Burr may be related to the drop in the degree of unsaturation of the phospholipids below a certain level which is essential for their function.

(*Journal of Biological Chemistry*, volume 96, pages 103-125, 1932.)

30. Burr, G. O., Burr, M. M., and Miller, E. S.—*On the Fatty Acids Essential in Nutrition.*

Positive results in the cure of the deficiency disease are marked by renewed growth in weight and length, and by a clearing of the skin and an improvement of the hair coat. Linoleic acid was very effective in curing the deficiency disease as was linolenic acid, both in the form of methyl esters.

Oleic acid was found ineffective. Butter gave negative results. Tung oil had very feeble curative effects.

(*Journal of Biological Chemistry*, volume 97, pages 1-9, 1932.)

31. Sinclair, R. G.—*Relationship Between Degree of Unsaturation and Composition of Lipids in Animal Tissues.*

Continuing this type of investigation, Sinclair shows that the amount and kind of fat in the diet exerts a very pronounced and characteristic influence on the degree of unsaturation of both the phospholipids and the neutral fat in the tissues of the body.

(*Journal of Biological Chemistry*, volume 97, pages XXXIV-XXXV, 1932.)

32. Eckstein, H. C.—*Highly Unsaturated Fatty Acids in Butter.*

Eckstein demonstrated the presence of acids in butter fat, more highly unsaturated than oleic, his

calculation showing about 0.25 per cent. of linoleic acid.

(*Journal of Biological Chemistry*, volume 97, pages XXXV-XXXVI, 1932.)

33. Burr, G. O., and Beber, A. J.—*A Study of the Gas Exchange of Rats Suffering from a Deficiency of Unsaturated Fatty Acids.*

When rats are fat starved but receiving other foods, the respiratory quotient remains above 1.00. When they are completely starved, the quotient drops readily. Rats that have been cured of the fat starved condition show a normal daily metabolic course.

(*Journal of Biological Chemistry*, volume 97, pages XXXVI-XXXVII, 1932.)

34. Evans, H. M., and Lepkovsky, S.—*Vital Need of the Blood for Certain Unsaturated Fatty Acids.*

Comparison of the iodine numbers of the various methyl esters employed to correct fat deficiency disease is not a criterion for the content of curative fatty acids. Thus, rats fed a fat free diet have body fats with more unsaturated fatty acids than rats at the time of weaning, yet they possess smaller amounts of the curative unsaturated fatty acids.

(*Journal of Biological Chemistry*, volume 99, pages 231-234, 1932.)

35. Evans, H. M., and Lepkovsky, S.—*The Sparing Action of Fat on Vitamin B.*

In a study of the sparing effect of various glycerides of oleic acid on vitamin B shows that commercial oleic acids gave decidedly inferior results to the glycerides of purified oleic acid.

(*Journal of Biological Chemistry*, volume 99, pages 235-240, 1932.)

36. Berend, N.—*Ueber die Rolle der Stark Ungesättigten Fettsäuren im Organismus* (The Role of Highly Unsaturated Fatty Acids in the Organism).

In experiments on dogs fasting produced the reduction in the unsaturated fatty acids of the blood. In pathological lipemia such as occurs in diabetic dogs after the removal of the pancreas, the total fats of the blood are increased, but the unsaturated fatty acids are decreased, so that the percentage of unsaturated fatty acids to total fats is much lower than normal. Large doses of insulin raise this percentage to normal.

(*Biochemische Zeitschrift*, volume 246, pages 117-123, 1932.)

## 1933

37. Hansen, Arild E.—*Study of Iodine Number of Serum Fatty Acids in Infantile Eczema.*

In ten cases of eczema in sixteen normal infants of similar age, the average iodine number of the serum fatty acids in the eczema group was considerably lower than the average iodine number in the control group. This indicates that the serum fatty acids contain less unsaturates in infantile eczema than are present in the blood of normal control infants.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 30, pages 1198-1199, 1933.)

38. Hansen, Arild E., and Burr, G. O.—*Studies of Iodine Absorption of Serum in Rats Fed on Fat Free Diets.*

Because of the apparent necessity for unsaturated fats in the diet, the comparison of the iodine absorption of the serum lipids of control rats with that of animals on fat free diets was studied, and found to be distinct.

The highest value found in fat free animals did not reach the lowest value found in control groups. The results were considered particularly significant since the diet of the controls was comparatively low in fat made up largely from milk.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 30, pages 1200-1201, 1933.)

39. Hansen, A. E.—*Serum Lipid Changes and Therapeutic Effects of Various Oils in Infantile Eczema.*

Oils rich in unsaturated fats gave good clinical results in two infants suffering with severe eczema. Twelve additional cases treated in like manner showed a similar response.

The same diet and the same local care of the skin were observed in all cases. Four cases were studied in respect to the iodine number of the serum fatty acids. The control in this group showed a steady decline but the cases receiving corn oil and particularly linseed oil showed steady and unquestionably marked gain as the eczema improved.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 31, pages 160-161, 1933.)

40. Burr, G. O., and Brown, W. R.—*On the Fatty Acids Essential in Nutrition.*

In this contribution Burr and Brown review the work of other investigators who reported scaly skin and necrotic tails not associated with fat deficiency and not curable by the administration of suitable fats.

Funk and his associates did not use an adequate amount of vitamin B. The animals of Roche and Roche were so deficient as to have weighed only from 80 to 100 grams after twelve weeks. Hume and Smith admit that the supply of B<sub>1</sub> and B<sub>2</sub> was insufficient for good growth nor did their animals always receive sufficient vitamin A as bladderstone developed in some instances. Gregory and Drummond used an inadequate yeast extract, obviously deficient in one or more of the water soluble vitamins.

The authors fully answer all of the causes for conflict in the partial corroboration of their findings by other investigators. They point out that the fat deficiency disease is characterized by a late failure in growth after an early period of rapid growth in the presence of excess growth factors. The growth failure is accompanied by a high percentage of kidney lesions, abnormal gas exchange and abnormal water consumption.

Whereas necrosis of the tail and scaly skin can result from numerous dietary conditions, it is neither necessary nor justifiable to assume that these diverse causes work through a common factor such as abnormal skin lipids which they believe responsible for the scaliness in their rats.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 30, pages 1349-1352, 1933.)

41. Rof, J., and Thurnherr, A.—*Ueber das Verhalten der Ungesättigten Fettsäuren bei Experimenteller Nierenschädigung und bei Sauerstoffmangel (The Condition of the Unsaturated Fatty Acids in Experimental Renal Injury and Lack of Oxygen).*

Poisoning by mercuric chloride showed an increased unsaturated fat content of the kidney, but poisoning by cantharides showed a decrease. The suggestion is made that the difference in effect of the unsaturated fatty acids of the kidney to the two types of renal poisons may be related to the supply and utilization of oxygen. Rats fed on practically fat free diets were found more sensitive to oxygen deprivation than rats fed normal diets; and they also showed a more rapid loss of unsaturated fatty acids in the various organs.

(*Zeitschrift für die gesamte Experimentelle Medizin*, volume 88, pages 693-704, 1933.)

42. Tanze, U.—*The Effects of Fatty Acids on Nutrition.*

Fat starved rats developed a definite nutritional disorder characterized by a loss of hair, later an inflammation, then dermatitis and scaly skin. The eyes were swollen and closed, though the changes were not due to vitamin A deficiency. There was a retarded growth. Immediately upon restoring linoleic acid to the diet, a soft, fine coating of hair appeared in the denuded areas, growth was normally resumed and the animals became normal. The hair developed a lustrous sheen and the eyes became extremely bright and clear. Oleic acid was ineffective and linolenic acid was neither constant nor at any time as effective as linoleic acid. No sparing action of linoleic acid or linolenic acid for vitamin B was found. Soybean oil was tested but was not comparable with linoleic acid in its effect. The fatty acids from cod liver oil were not effective.

(*Scientific Papers from the Institute for Physical and Chemical Research, Tokyo*, volume 20, pages 13-28, 1932, and volume 22, pages 1-13, 1933.)

43. Hinsberg, K., and Holland, G.—*Ueber das Jodbindungsvermögen im Blute unter Normaler und Pathologischer Verbindung (The Iodine Absorption Value of the Blood Fats in Normal and Pathological Conditions).*

The values for unsaturated fatty acids are constant for normal persons but are increased in diseases of the liver and in pernicious anemia. The administration of linoleic acid by mouth lowered the blood sugar in diabetics sometimes as much as 100 per cent. in from three to four hours.

(*Klinische Wochenschrift*, volume 12, pages 1601-1602, 1933.)

44. McCollum, E. V., and Becker, J. E.—*Linoleic Acid Indispensable to Normal Nutrition.*

A diet containing everything else which is essential but lacking in linoleic acid will fail to maintain life. It must therefore be provided in food.

(*Food, Nutrition and Health*, Baltimore, 1933.)

## 1934

45. Burr, G. O., and Beber, A. G.—*Metabolism Studies with Rats Suffering from Fat Deficiency.*

The experiments clearly show that fat deficient rats are very different from stock animals and that fat deficient rats which have been cured with small doses of fats return to a much more nearly normal gas exchange. The most marked difference shown by fat deficient rats are higher basal rate, higher specific dynamic action of food and higher respiratory quotients. Rats synthesize large amounts of fat daily, but this synthetic fat does not prevent the fat deficiency disease.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 31, pages 911-912, 1934.)

46. Holland, G., and Hinsberg, K.—*Ueber die Physiologische Bedeutung Ungesättigter Fettsäuren und das Jodbindungsvermögen des Blutes (The Physiological Significance of Unsaturated Fatty Acids and the Iodine Absorption of the Blood).*

The average value of the iodine absorption number of the blood serum is between 500 and 600 mg. per cent. and shows very little variation. In cases with marked cardiac decompensation, the value doubled and dropped to normal as compensation became established. In cardiac disease with good compensation there is little change in the value. In pernicious anemia liver treatment reduced the iodine absorption value from a high to a normal amount. Upon discontinuing liver treatment, the unsaturated fatty acids again rose.

(*Zeitschrift für die gesamte Experimentelle Medizin*, volume 94, pages 485-494, 1934.)



47. Evans, H. M., Lepkovsky, S., and Murphy, Elizabeth A.—*Vital Need of the Body for Certain Unsaturated Fatty Acids (a digest of three communications)*.

A fat free diet although adequate in other vitamins showed a failure in the production of young in 20 per cent. of the female rats after implantation had occurred.

In a much higher percentage, abnormal pregnancies were evidenced by a peculiarly prolonged gestation period, and a difficult parturition due to impairment of the birth mechanism. Eighty per cent. of the young were born dead and the rest died soon after birth. Successful gestation on fat free diets is therefore impossible.

Fortification with carotin or with increased amounts of vitamins A, D and E did not essentially modify the outcome. The addition of a preparation containing essential unsaturated fatty acids improved the percentage of pregnancies, the number or young born alive, the gestation mechanism and period and the ease of parturition.

The unsaturated fatty acids are again referred to as vitamin F, which, in addition to the early findings of Evans, Lepkovsky and Burr, seems to refer to the identical unsaturates related to the Burr fat deficiency syndrome. Sex instinct is diminished with vitamin F deficiency and restored when vitamin F is returned to the diet.

(*Journal of Biological Chemistry*, volume 106, pages 431, 441, and 445, 1935.)

## 1935

48. Oncken, Mildred—*Unsaturated Fatty Acids (Vitamin F) Deficiency*.

Oncken reviews much of the literature and reports experiments suggesting that the vitamin F content of the blood is reduced even in mild infections such as the common head cold. A deliberate use of vitamin F based on this observation was successful in the treatment of white rats suffering from "snuffles."

Oncken emphasizes the depletion of vitamin F in the daily diet due to the increased use of hydrogenated fats and in many instances of the replacing of fats by nutritionally inadequate substances.

(*Illinois Medical Journal*, volume 67, pages 236-239, 1935.)

49. Williams, H. H., and Anderson, W. E.—*The Liver and Theory of Fatty Acid Desaturation*.

Reference is made to the indispensability of linoleic acid in the diet and to the probably outstanding importance of this acid in the liver. Linoleic acid is accepted as a necessary constituent of the food together with the amino acids of the proteins, the vitamins, salts, etc.

(*Oil and Soap*, March, 1935.)

50. Boyd, E. M.—*The Lipopenia of Fever*.

Boyd corroborates the finding that the blood lipids respond to febrile conditions. He points out that the onset of fever is accompanied by a sudden flood of unsaturated fatty acids (vitamin F) into the blood stream. He interprets the result as indicating a general derangement of fat metabolism in fever which he suggests as being due probably to an excessive removal of transport fats from the plasma by the active body tissues. An excellent bibliography is appended.

(*Canadian Medical Association Journal*, volume 32, pages 500-506, 1935.)

51. Haven, Francis L.—*Effect of Dietary Fats on Growth and Composition of Tumors*.

In a study of the various fats it was found that the growth tendencies of rat tumors on coconut

oil diets were greater than those of rat tumors on cod liver oil diets.

The inhibitory action of unsaturated fats on the growth of tumors is explained by the theory that phospholipids function as oxygen transport agents within the cells. The incorporation of unsaturated fatty acids into the phospholipids of tumor cells may aid respiration and thus may inhibit tumor growth.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 32, pages 734-737, 1935.)

52. Lepkovsky, S., Ouer, R. A., and Evans, H. M.—*The Nutritive Value of the Fatty Acids of Lard and Some of Their Esters*.

Under conditions that were strictly constant so that the only variable factor was the character of the fat employed, lesions corroborating the kidney lesions first suggested by Burr were found. The glycerides of the fatty acids of lard seem to be the best for the prevention of these lesions. Since glycerides are hydrolyzed in the intestinal tract, the authors found it difficult to understand the inferiority due to the direct feeding of a mixture of glycerol and free fatty acids, as compared with the glycerides of the fatty acids themselves.

(*Journal of Biological Chemistry*, volume 108, pages 431-438, 1935.)

53. Evans, H. M., and Lepkovsky, S.—*The Sparing Action of Fat in Vitamin B*.

The experiments reported here permit the conclusion that fat does not spare vitamin B by reducing the loss of this vitamin in the feces, but by decreasing the amount of this vitamin dissipated in the metabolism of the rat. The liver was found to be the site of the greatest initial withdrawal of vitamin B, and a high fat diet definitely diminished the withdrawal.

(*Journal of Biological Chemistry*, volume 108, pages 439-455, 1935.)

54. Sinclair, R. G.—*Metabolism of the Phospholipids*.

A microprocedure is described, making it possible to determine the relative proportions and the iodine numbers of the saturated solid and the unsaturated liquid fatty acids in 30 to 40 mg. samples of material.

The author finds evidence of the selection and retention of highly unsaturated fatty acids by tissue phospholipids. From previous findings Sinclair suggests that there are at least two classes of phospholipids; one comprises the more highly unsaturated phospholipids and functions in the essential make-up of the cell, and the other comprises less saturated phospholipids functioning as an intermediary product in the metabolism of fat. Both classes are present in the liver but in skeletal muscle the phospholipid is mainly of the non-metabolic type.

(*Journal of Biological Chemistry*, volume 111, pages 261, 275, and 515, 1935.)

55. Lecoq, R.—*Peut-on, dans une Ration Equilibrée, Substituer Aux Glycerides Les Acides Gras Qui Leur Correspondent? (Question of Substituting Fatty Acids for Glycerides in a Balanced Diet)*.

Lecoq reports experiments on pigeons in which it was found that in a balanced diet containing natural fats such as butter, linseed oil, etc., it was impossible to substitute the corresponding fatty acids without causing malnutrition and signs of vitamin B deficiency. The author notes that some essential substance is likely to be removed in the process of preparing the fatty acids.

(*Comptes rendus de l'Académie des Sciences*, volume 200, pages 1979-1980, 1935.)

56. Cox, W. M., and Inboden, M.—*A Purified Diet Satisfactory for Growth, Reproduction and Lactation in Rats.*

The purified diet suggested consists of casein, dextrin, lard-wheat germ oil, aqueous extract of brewer's yeast, carotene, calcium acetate, salt mixture and rice cellulose.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 34, pages 453, 456, 1936.)

57. Brown, W. R., and Burr, G. O.—*Some Recent Studies in Fat Deficiency.*

A composite growth curve for more than 200 rats on fat deficient diets are practically identical with the earlier work published by Burr and his associates. Relatively impure diets can be used for producing fat deficiency symptoms.

Buttermilk lipids though rich in unsaturates are not curative when fed to rats showing the fat deficiency syndrome. Yeast oil is also ineffective. Scaliness decreases during the summer months so that humidity is related to the severity of the symptoms being less severe in summer and more severe in winter.

(*Journal of Biological Chemistry*, volume 114, page XVI, 1936.)

58. McAulis, A. J., and Sweet, M. H.—*The Influence of a Diet Rich in Avocado on Growth and on the Quality of Body Fat in the Albino Rat.*

When avocado was used as the main constituent of the diet and supplemented by dried skim milk, the growth of rats compared favorably with that of animals on adequate stock diets.

(*Journal of Biological Chemistry*, volume 114, page LXIV, 1936.)

59. Sinclair, R. G.—*Evidence of the Synthesis of Essential Unsaturated Fatty Acids by the Rat.*

Sinclair finds that the growth of rats raised on a diet devoid of unsaturated fatty acids is distinctly subnormal, yet considerable. A high intake of elaidin almost completely abolishes the limited synthesis of highly unsaturated fats from carbohydrates and thus prevents growth.

(*Journal of Biological Chemistry*, volume 114, page XCIV, 1936.)

60. Stosser, A. V.—*Iodine Number of Serum Fatty Acids in Acute Infections of Infants with and without Eczema.*

Stosser refers to the work of Hansen and to his own previous report, observing that the total cholesterol value was much less at the height of the infection than during the period of convalescence. Pneumonia showed the greatest change, eczema showed some change.

(*Proceedings of the Society for Experimental Biology and Medicine*, volume 34, pages 10-11, 1936.)

61. Shepherd, M. I.—*Vitamin F in Skin Creams.*

Shepherd reviews the development of the vitamin F concept in relation to the lecithin, cholesterol and vitamin F content of the skin. The empiric use of linseed oil is reviewed in the light of its effectiveness because of its unsuspected vitamin F content. A ratio for normal skin between cholesterol, lecithin and total unsaturates including vitamin F was given as 1:1:3.

(*Drug and Cosmetic Industry*, March, 1936.)

62. Shepherd, M. I., and Linn, E. R.—*Evaluation of Vitamin F.*

A detailed procedure for the quantitative estimation of vitamin F effectiveness is proposed, sug-

gesting a unit. The vitamin F is externally applied. Vitamin F is present in normal rat skin but not in rat skin derived from animals suffering the Burr fat deficiency syndrome. Emphasis is made on the probable value of the vitamin F content of lard when this material serves as an ointment paste in the treatment of eczema and other conditions.

(*Drug and Cosmetic Industry*, May, 1936.)

63. Shepherd, M. I., and McMath, Dorothy C.—*Lipid Balance in Creams.*

Creams which represent modified ointments are formulated so as to include the fat ratio in which the lipids comprising lecithin, cholesterol and vitamin F are proportioned in the ratio of 1:1:3.

(*Drug and Cosmetic Industry*, July, 1936.)

64. Glennou, Kathryn—*Vitamin Soaps.*

The effectiveness of official Sapo mollis and the dependence of this effectiveness on the presence of vitamin F in the linseed oil from which Sapo mollis is prepared, suggests that all soap becomes more effective if a definitely known quantity of vitamin F is purposely added. The quantity suggested is about 125 vitamin F units per gram of soap.

(*Soap*, November, 1936.)

65. Pacini, August J., and Avis, H. Wentworth—*Vitamin F in Cosmetics.*

A complete discussion of the natural occurrence of vitamin F is presented. Oils are divided into four groups: the wide variation of vitamin F content due to natural causes is shown for each of the four groups. Vitamin F deficiency symptoms are detailed and the curative effects of vitamin F on the human skin are exemplified by actual microphotographs.

The relation of vitamin F to the lustre and pliability of human hair is disclosed as a corroboration in the human of the improvement in fur quality frequently reported for laboratory animals.

The inadvisability of using other than biologically standardized vitamin F material is compared to the identical case in the use of cod liver oil as in vitamin A and D source without further knowledge of the exact A and D content.

The resemblance of vitamin F to the ricinoleates in a remarkable detoxifying property is discussed.

Some evidence is advanced which indicates that all vitamin F is linoleic acid but not all linoleic acid isomers are vitamin F. Thus, neither the unsaturation of the fat nor the chemical detection of a linoleic isomer is sufficient as a measure of vitamin F effectiveness. Biological assay is imperative.

(*Soap, Perfumery and Cosmetics*, September, 1936.)

66. Pacini, August J.—*Vitamin F (Unsaturates).*

Symptoms suggesting vitamin F deficiency are apparently more prevalent among humans than symptoms suggesting deficiencies due to all other vitamins combined. Dry skin, brittle, lustreless and falling hair, dandruff, brittle fingernails and eczema, and kidney disease are exaggeratedly numerous and ubiquitously distributed. The relation of vitamins to perfumes passing through intermediate products such as sex hormones and the like is pointed out as a relation much deeper than the apparent superficial difference. The importance of measured vitamin values and the elimination of the use of crude, unstandardized materials is stressed. The immunological and detoxifying properties of vitamin F, like those of the ricinoleates, are discussed.

(*American Perfumer*, December, 1936.)



**IMPORTANT:** Vitamin F is to linseed oil what vitamins A and D are to cod liver oil.

Linseed oil is an official galenical in the Pharmacopoeia of the United States. It has been used medically for ages, on humans, both externally (Carron oil, Sapo Mollis, Wilkerson's Salve, Thompson's emulsion, etc.) and internally. It is still so used.

Linseed oil is a source of unsaturated fatty acids, called vitamin F, and including some form of linoleic acid about which Prof. E. V. McCollum and J. Ernestine Becker say: "It is indispensable to normal nutrition. A diet containing everything else which is essential but lacking in linoleic acid (now called vitamin F—ed.) will fail to maintain life." — Food, Nutrition and Health, Baltimore, 1933.

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2. The occurrence of diarrhea was less frequent in the gelatinized milk group and acidified milk group than in the plain milk group.
3. The group of infants fed gelatinized milk had a better rate of gain than those groups fed acidified milk or plain cow's milk.
4. Vomiting and "appetite poor" symptoms among the infants were obviated or showed improvements when fed gelatinized milk in contrast to the feeding results of the other groups which showed little change.
5. The infants in the gelatinized milk group had more favorable results than the acidified milk group or cow's milk group in relation to constipation.

\* [ One or two per cent of Knox Gelatine was added to the formula water which had been boiled and cooled. The gelatine was softened ten minutes before being added to the milk of the formula. ]



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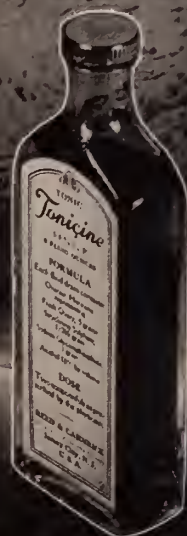




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## Book Reviews

**PREOPERATIVE AND POSTOPERATIVE TREATMENT.** By Robert L. Mason, A. B., M. D., F. A. C. S., Assistant in Surgery at the Massachusetts General Hospital. 495 pages with 123 illustrations. Philadelphia and London. W. B. Saunders Company, 1937. Cloth, \$6.00 net.

This book presents a detail consideration of the preparation and after care of surgical patients. The work is up-to-date in every detail and will be found a valuable adjunct to all surgeons.

**LIGHT THERAPY.** By Frank Hammond Krusen, M. D. Forty-two Illustrations. Second Edition Revised and Enlarged. New York. Paul de Hoeber, Inc. 1937. Price \$3.50.

This volume epitomizes and clarifies existing data concerning light therapy. We believe that the physician who reads this work will be able to practice light therapy, within the bounds of existing knowledge with ease and intelligence.

## ILLNESS INCREASES UNDER THE PANEL SYSTEM

The steady increase under health insurance in England and Wales is becoming a constantly increasing problem, according to Howard N. Mummery. In the *Practitioner* (137: 281 [Sept.] 1936) he says that it has been computed that about 50 per cent of the 15,000,000 insured population in England and Wales "go on the panel" every year and that over 31,000,000 weeks' working time is lost annually by industrial workers through sickness alone. The average annual duration of sick absence is roughly estimated at ten days for men and twelve days for women, but these figures do not include the first three days or less of absence, for which no benefit is paid.

Although the standard of life among the working population has risen and mortality rates have fallen during the past fifteen years, there has been a steady increase in the annual sickness claims. The duration of sick absences has increased from an average of 16½ days to twenty-eight days per person. Absences are longer when the employer adds to the insurance benefits during sickness. Insurance practitioners find that certain types of panel patients seem to think that they have a statutory right to so many weeks on the panel each year. The bugbear of all industrial doctors is "nervous debility," which looms large among the diagnoses on panel certificates. Many such patients are women who continue to do their household work while receiving the gossip and sympathy or envy of their friends.—*Jour. A. M. A.*

Sexual underdevelopment in 18 boys was treated by injection of the anterior pituitary-like hormone of pregnancy urine. Successful results were obtained in 66 per cent, and partial success in an additional 14 per cent. "On the average, treatment totaling 4,800 R. U. over a period of 8 weeks should suffice to determine whether or not results are to be expected." Sexton, D. L., *Endocrinology* 20:781, 1936.





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## Book Reviews

**THE BEHAVIOR OF HEALTH.** By Dr. N. A. Ferri. Boston. Bruce Humphries, Inc. 1937. Price, \$1.00.

In this work the author has woven the threads of psychology, economic solution, social influences as well as physiological, to form a picture easily grasped by the unprofessional. Step by step, he leads to the premise that a man can overcome his deficiencies and build a congenial environment through sane living and the intelligent application of suggestion.

**HEALTH QUESTION ANSWERED.** By W. W. Bauer, M. D. Indianapolis. New York. The Bobbs-Merrill Company. 1937. Price \$2.00.

This is the first edition. Sixteen hundred and eighty health questions are answered in this book, selected from more than ten thousand letters addressed to the American Medical Association asking almost fifteen thousand questions.

**OPERATIVE SURGERY.** By J. Shelton Horsley, M. D., and Isaac A. Vigger, M. D. In Two Volumes. Fourth Edition. St. Louis. The C. V. Mosby Company. 1937. Price \$15.00.

This work contains contributions by C. C. Coleman, M. D. John S. Horsley, M. D., Austin I. Dodson, M. D., and Donald M. Faulkner, M. D.

This fourth edition follows the same general line as the previous edition and does not attempt to be an encyclopedic work. The methods described are those which either have been actually used by the author who

writes of them or which seem to him to be the best for the lesion under consideration. In this work the author attempts to base operative procedure upon physiological functions as well as upon anatomic structure and to retain physiologic function whenever consistent with the main object of the operation.

**PREOPERATIVE AND POSTOPERATIVE TREATMENT.** By Robert L. Mason, A. B., M. D., F. A. C. S., Assistant in Surgery at the Massachusetts General Hospital. 495 pages with 123 illustrations. Philadelphia and London. W. B. Saunders Company, 1937. Cloth, \$6.00 net.

This up-to-date work will prove useful to teachers and pediatricians, to general practitioners, to resident physicians and to graduate and undergraduate students. Some of the changes in the edition are as follows: Preventive measures have been emphasized; particular attention has been paid to the section dealing with anatomy and physiology, and growth and development. The subject of clothing has been carefully rewritten; the entire matter of artificial feeding has been put upon a simpler basis; methods of calculating calories and percentages has been retained; the charts on vitamins has been checked and brought up-to-date; the chapter on tuberculosis has been rewritten; additions have been made to the chapter on poisons; the treatment of dehydration in gastroenteritis has been detailed by chart; congenital heart disease has been brought up-to-date and that which is helpful to the clinician in the newer knowledge of the endocrines has been added.

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## Book Reviews

**SURGICAL PATHOLOGY OF THE THYROID GLAND.** By Arthur E. Hertzler, M.D. With 238 illustrations. Philadelphia, Montreal & London. J. P. Lippincott Company. 1936.

This work represents a vast clinical experience of the author, who has been able to follow patients to a greater degree than has been possible to most investigators due to his continued residence in a small community for more than forty years.

**INTERNATIONAL CLINICS.** Edited by Lewis Hamman, M. D. Volume I, Forty-seventh Series. 1937. Philadelphia, Montreal, London. J. B. Lippincott Company. 1937.

This work is a quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery and all the specialties by leading members of the medical profession throughout the world.

**MATERIA MEDICA, TONICOLOGY AND PHARMACOGNOSY.** By William Mansfield, Phar. D. With 202 illustrations. St. Louis. C. V. Mosby Company, 1937. Price \$6.75.

This work should prove of immense value to physicians, pharmacists, and students of pharmacy, medicine, and nursing. The work is a text and reference book on the therapeutics, toxicology, pharmacognosy, and posology of the official drugs of the United States pharmacopoeia XI and the National Formulary VI.

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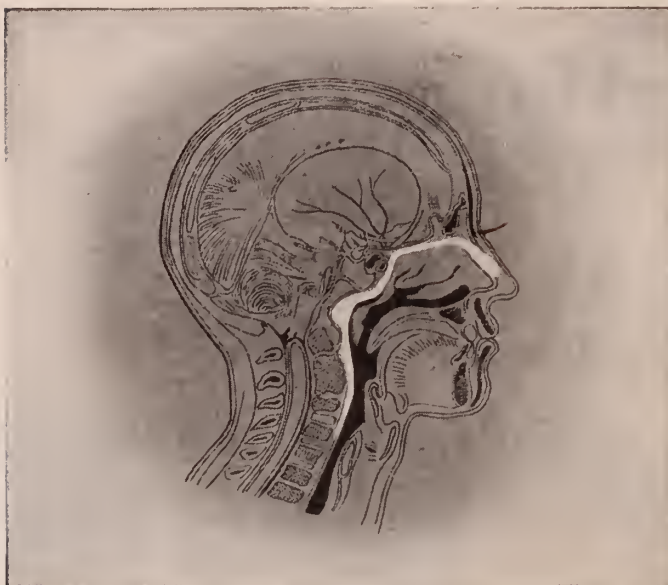
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**HAND BOOK OF ORTHOPAEDIC SURGERY.** By Alfred Rives Shands, Jr., M.D. In collaboration with Richard Beverly Raney, M.D. With 169 illustrations. St. Louis. The C. V. Mosby Company. 1937. Price, \$5.00.

This work presents for consideration for the medical student and the general practitioner the fundamental principles of orthopaedic surgery as concisely as possible and yet in sufficient detail to convey a well rounded knowledge of the subject.

## Book Reviews

**OPHTHALMOSCOPY, RETINOSCOPY AND REFRACTION.** With new chapter on orthoptics. By W. A. Fisher, M.D. Fourth revised edition. With 240 illustrations, including 24 colored plates. Chicago. H. G. Adair Ptg. Co. 1937. Price, \$2.00.

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**THE INTIMATE SIDE OF A WOMAN'S LIFE.** By Leona W. Chalmers. With a Foreword by Winfield Scott Pugh, M. D. Radio City. Pioneer Publications, Inc. Endocrinology. Clinical Application and Treatment. By August A. Werner, M. D. Illustrated with 265 Engravings. Philadelphia. Lea & Febiger. 1937.

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## CONTENTS:

Editorials (For Titles See Extended Table of Contents) ..... 365

### ORIGINAL ARTICLES

Surgical Treatment of Peptic Ulcer and Complications. *Howard K. Gray, M. D., Rochester, Minn.* ..... 411  
Cancer. *Max Cutler, M. D., Chicago.* ..... 413  
Gillies Operation for Depressed Fracture. *Paul W. Greeley, M. D., Winnetka, Ill.* ..... 419  
Huge Retro-Vesical Myxoma. *Emil Jonas, M. D., Chicago* ..... 420  
Physical Therapy re General Office Practice. *H. P. Miller, M. D., Rock Island, Ill.* ..... 422  
Raw Apple Dietary re Diarrhea with Melena Neonatorum. *William J. Corcoran, M. D., Chicago* ..... 426

Lawrence—Moon—Biedl Syndrome. *James B. Gillespie, M. D., Urbana, Ill.* ..... 429  
Zinc Ionization re Treatment of Trachoma. *Samuel M. Edison, M. D., Chicago.* ..... 431  
Cesarean Section. *Willard C. Scrivner, M. D., East St. Louis, Ill.* ..... 436  
Prenatal Syphilis a Preventable Disease. *S. J. Zakon, M. D., Chicago.* ..... 438  
Pharyngeal Diverticula. *Albert E. McEvers, M.D., Los Angeles, Cal.* ..... 441  
X-Ray of Abdomen in Lead Colic. *Wm. J. Pickett, M. D., A. R. Nachman, M. D., and R. O. Levitt, M. D., Chicago.* ..... 442  
Modern Management of Varicose Veins. *Leo M. Zimmerman, M. D., Chicago.* ..... 444

(Continued on page 8)

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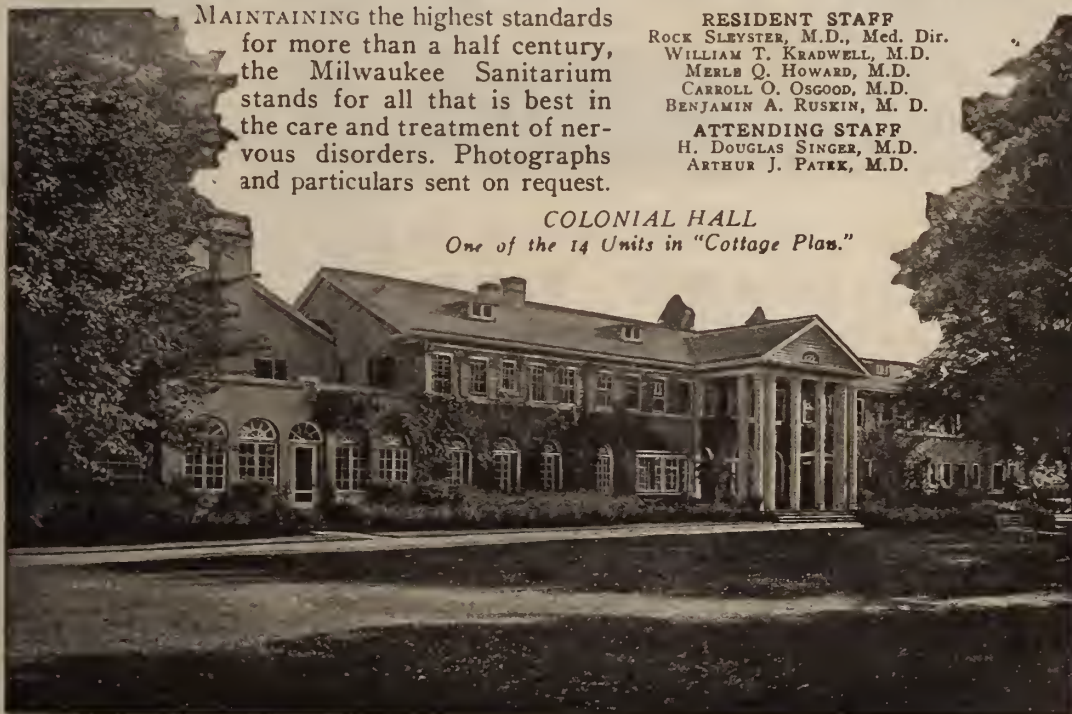
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(1) a. 1935. J. Am. Med. Assn. 105, 1608  
b. 1936. Ibid. 106, 996

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## CONTENTS—Continued

### ORIGINAL ARTICLES

Hypotension or Low Arterial Pressure. *D. M. Roberts, M. D., Alton, Ill.*..... 448

Illinois State Medical Society, 71st Annual Meeting..... 375

### EDITORIALS

Short Shots—Long Conclusions..... 365

Medical Officials or Doctors?..... 367

Vital Statistics vs. Prophecies..... 368

Cost of State Medicine re Taxes..... 369

Medical Economics. *E. S. Hamilton*..... 370

Ethics vs. Economics. *Charles S. Skaggs*..... 370

### CORRESPONDENCE

Beg Your Pardon. *Kellogg Speed*..... 374

Alumni, University of Illinois. *C. H. Pfifer*..... 374

Washington University. *Nancy L. Blair*..... 374

Congress of Radiology..... 374

### SOCIETY PROCEEDINGS

Mercer County ..... 453

Ogle County ..... 453

Marriages ..... 453

Personals ..... 453

News Notes ..... 455

Deaths ..... 456

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★*Proc. Soc. Exp. Biol. and Med.*, 1934, 32, 241-245  
*Laryngoscope*, Feb. 1935, Vol. XLV, No. 2, 149-154  
*N. Y. State Jour. Med.*, June 1935, Vol. 35, No. 11  
*Arch. Otolaryngology*, Mar. 1936, Vol. 23, No. 3  
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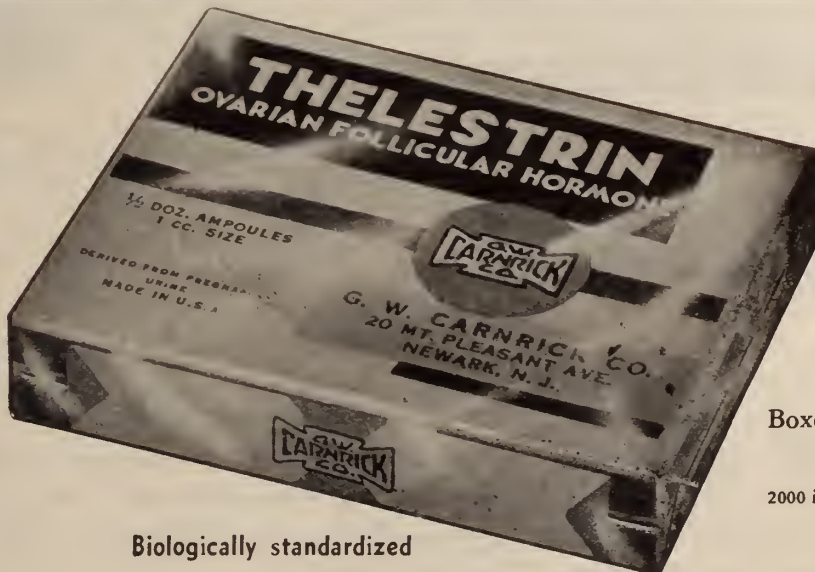
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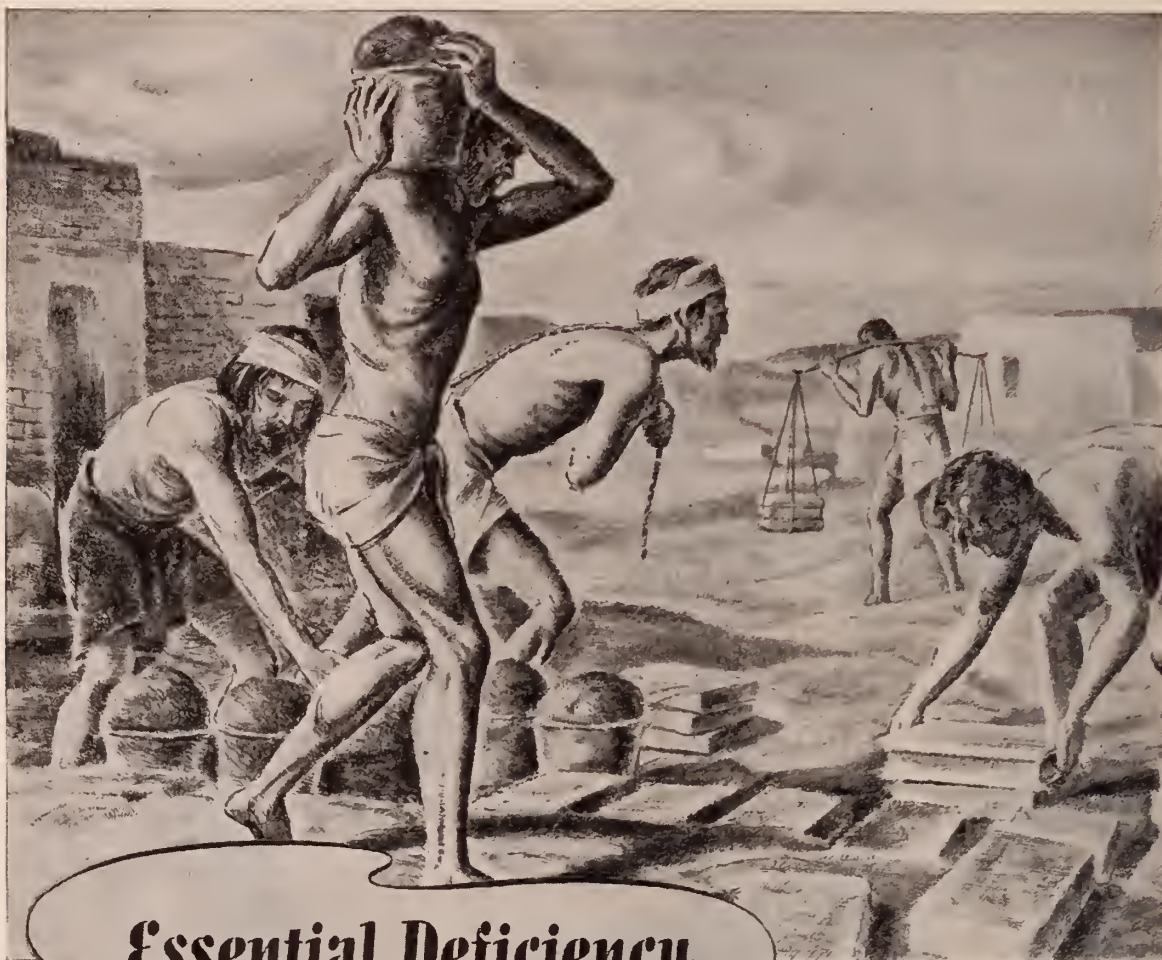
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# ILLINOIS MEDICAL JOURNAL

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## Editorials

### SHORT SHOTS AND LONG CONCLUSIONS

The Supreme Court of the United States made and recognized history when it handed down those momentous decisions declaring unconstitutional the N.R.A., the railroad pensions act and similar legal tripe. When the august tribunal, the sanctuary of justice in a land debauched by alien, socialistic, undemocratic and unAmerican ideas gets around to the question of so-called "health" or "sickness" insurance or state medicine, and the Munchausenistic "Social Security Act" then the scales of justice will right themselves where the medical profession is concerned.

\* \* \*

What has been called the "inevitable bureaucracy" of sickness and health insurance is now considered the best "longshot gamble" by that horde of parasites which feeds upon the actual laborers and tax-payers of the nation. Examine the high costs of relief administration and the announcement of the Illinois section that "executive costs" *must come down*, and the answer is not hard to find.

\* \* \*

American labor rather than unAmerican propagandists should dominate the United States wage system. The American laborer, whether he wears blue jeans or white collars would rather have a weekly pay envelope that will let him pay his own doctor's bills rather an assessment that lets the other fellow do the job. The other fellow is usually a sociological "middleman," trained to take somebody's orders and then to spend somebody else's wages. This system of bureaucratic spending is getting a big jolt from the findings that the mass system of relief orders yield only chicanery and poor service. So the idea now is to give the dole in cash and let the benefactors do their own buying rather than to spend so much money in salaries for the political jobbists in administrative posts, which is the Washington idea.



The German medical act is said to contain 3,000 sections. Now if there is a "boss" for each section, and if the socialists finally get the "German idea" transferred to America it is easy to figure just how many political jobs this will mean at the taxpayers' expense and why some politicians are so eager for State Medicine in the United States. The trouble with state medicine of course is that it is far more "state" than "medicine." Every high school boy remembers the exclamation of the Bourbon who remarked, "L'etat? L'etat est moi." That is the idea of the lobbyist and bureaucrat, "The state? I am the state."

It might be as well to recall the comment of another Frenchman—"L'apres moi, le deluge." What will happen to the country when the cheating communist has ruined the country and the nation beholds the result of "After me, the deluge?"

\* \* \*

The panel doctor finds himself a physician on the ten cent store idea. Austria, England, France and Germany reverberate to the same wail. Nickle and dime stores may flaunt their wares on the boulevards. Will American citizens have such service in their clinics, their hospitals, or their family sick-rooms?

Chief Justice Oliver Wendell Holmes said: "It has long been recognized that legislation is just as likely to follow public emotion as to be guided by scientific knowledge." Oliver was right! But in the case of the Social Security Act legislation would seem to have followed the public destroyer, and the communist at the gate. If the Puritan ancestors of the late Chief Justice were on the job today it is likely that scientific knowledge of the fowling-piece and powder-horn would clean out a few of the warrens of Washington where bureaucracy breeds, communism concentrates, and the Constitution is regarded as lightly as last year's song-and-dance act in the vaudeville show of nations.

\* \* \*

Charles H. Pfifer, president of the Chicago Medical Society, says wisely. "Thorough organization is especially necessary at the present time with the great political, social and economic unrest, when reformers of every type are beleaguering the medical profession and offering all sorts of Utopian panaceas to a guillible and bewildered public. *We must meet organization with*

*organization. As individuals we can do nothing and may be forced to dance to the tunes of sociologists and reformers."*

Dr. Phifer sounds the theme song of the ILLINOIS MEDICAL JOURNAL for many years. With keen vision Phifer probes the future. Is it fair, is it decent, is it MORAL, for members of the most necessary unit in human economics to turn "geisha-girl" for the whims of invading socialists, cheap communists and moneymad theorists coupled with politicians to whom power and pay are the only ethical indices of life and who can sense no other moral background?

What has become of the Declaration of Independence? Where is the Constitution of the United States about to land? According to the present legislative tendency socialistic powers and bureaucratic ideas this sacred document will soon rest in the national garbage barrel.

\* \* \*

Public Health Medicine is in reality national prophylaxis and is not to be confounded with the science of curative medical practice or remedial surgery. Yet it is on the ladder of *Public Health Medicine* standing rooted in "government appropriations" that State Medicine is climbing to confound Americanism and to reduce the United States to a state that is worse than Russia. Russia! Pity the poor soviet where even castor oil, or surgical gauze are too precious for the ills of the proletariat. Universal and promiscuous abortion would seem to be the soviet's gift to medical practice, bounded of course by the confines of the soviet state. What right has the United States government to practice medicine? What cash except that which the citizenry, including medical men, put into the government purse? Let the government, national or community, care for the indigent sick, or the necessarily unemployed but let physicians practice medicine, let them rule as to how medicine should be practiced and let the medical profession pursue the tenor of its ways undisturbed by the interfering laity whose ignorance of medicine is equalled only by the supreme self-conceit of its meddling egoists.

\* \* \*

More than 35,000,000 persons in the United States today are gainfully employed. These wage earners and their dependents, total something like 100,000,000 persons or perhaps 80% of the population. Why should the medical pro-

fession of the United States be first pauperized and later destroyed for a mere 20% of the country's inhabitants?

The answer is that this condition is being sought in order to increase political power of a few bureaucrats; to furnish easy berths for political hangers-on and to let those un-American Americans in whose pockets burn the soviet shilling, earn the wage they have collected from organized, embattled and attacking socialism and communism. No enigma there—not even a cross word.

### MEDICAL OFFICIALS OR MEDICAL DOCTORS—WHICH? HOW LONG BEFORE POLITICAL “JOB-HOLDERS” ABSORB MEDICINE’S TIME-HONORED PROFESSION?

Over close affiliation between church and state is an historical wrecker of nations. Today such coalition between politics and medicine indicates the early destruction of the most human and the most mortally necessary of all the professions—the science and practice of medicine.

As has often been declared in these columns when politics controls medicine then “the tail is wagging the dog” and the end is near.

One of the ablest comments anent the situation appears in the October 1, 1936, issue of “Medical News,” the official organ of the Medical society of the State of New York.

Too lengthy to reproduce here in full, the following excerpts from the editorial will bear careful reading:

“The country’s educators should ponder on the problem that will confront them if the efforts of the protagonists of compulsory health insurance have their way, and such a form of delivering medical care to our people is thoughtlessly adopted.

“What type of youth would be attracted to a medical career? After a difficult medical course of four years, and the necessary preparatory one, then the arduous post-graduate internship—to be qualified for what? A job, with a fixed income, with a definite number of assigned patients who, to follow the custom set in England, are not thoroughly examined even if there were time allowed to do it; fixed hours of work, perhaps a paid vacation, and at the end—a pension. A job-holder’s career! A government employee with all that this implies!

“Obviously such a system will attract quite a different type of men than was drawn into the present system, men who have won high renown and have given American medicine the high place it holds today.

“Will not the emphasis in medical education also have to change? *Will it not be necessary to train American medical officials rather than American doctors?* We see a similar change in a trend in the field of nursing. Formerly all student nurses were educated alike, now there is a distinct change toward *educating nursing administrators*. Those who actually handle the sick have less arduous curricula to cover. Since the financial income will be greater among the medical administrators of the system than among those of the rank and file who handle the sick, medical education will soon alter to meet the demand of those who will *seek careers, not as physicians to the sick but as a part of the controlling bureaucracy set over the physicians*. The colleges will give two types of education to meet the changed conditions. It will become necessary to lower standards (as was done in Russia) to attract sufficient numbers to meet the needs of the *so-called lower branches of the medical system*. Lower standards, reduced entrance requirements, and a totally different type of individual will be found taking up a medical career. And all this is proposed “for the betterment of mankind!”

“We, who are opposed to compulsory health insurance, call to the attention of our educators these thoughts, for we are deeply concerned with the *quality* of medical care our community will receive. We desire only the best quality of medical care obtainable, delivered by a man or woman of the highest type.

“The medical educators of our country have here a responsibility that they must continue to carry. Compulsory health insurance, obviously, is not an economic problem nor wholly a sociological question. It is a problem with which the educators of our youth are also concerned. Medical education must be planned to the end that we may maintain what we have laboriously won—a lower death rate, and a lower morbidity rate than any country where compulsory health insurance is in force, and a level of preventive medicine not equalled in any of the countries of Europe whose example we are so blithely urged to follow.”



## VITAL STATISTIC RESULTS BELIE PROPHECIES

The original "Act" from which eventuated Health Insurance,—a veritable dragon's egg—declared that it was "an Act to provide for insurance against total loss of health and the prevention and cure of sickness and for purposes incidental thereto."

Yet in England and Wales, the two countries among those working under "health insurance," which afford the most likely comparable conditions with those existing in America, the mortality rates WITH health insurance, the theorists' panacea for all ills, are far below those of the United States. Since no statistics are kept for non-fatal illnesses, only mortality figures can be cited. The compilations are from figures for the year 1934. It would seem that the United States would better stick to private practice and a lower death rate than to increase taxes and decrease population for the sake of aping an European custom so inordinately disadvantageous as "State Medicine" and "Health Insurance."

Here are a few of comparative vital statistics for various diseases for the year 1934 taken from an article by Fred L. Hoffman, LLd., entitled Compulsory Health Insurance and Disease Control appearing in the December, 1936, issue of The Weekly Underwriter.

Erysipelas prevailed in England and Wales at the rate of 3.6 per 100,000, while in this country the rate was 1.5. This highly infectious disease requires prompt medical treatment for efficient control and reduction in spread. In England and Wales the mortality increased from 2.6 in 1930 to 3.6 in 1934, while in the United States the rate decreased from 2.1 to 1.5.

Respiratory tuberculosis prevailed in England and Wales in 1934 at a rate of 63.5 per 100,000. The corresponding rate for this country was 51.2. There was a decrease in the rate in England and Wales from 73.9 in 1930 to 63.5 in 1934, and in this country from 63.4 to 51.2. Disseminated tuberculosis prevailed in England and Wales to the extent of 2.8 per 100,000 compared with a rate of 1.0 in this country. There was a decrease in the rate in England and Wales from 3.9 in 1930 to 2.8 in 1934, and in this country from 1.4 to 1.0.

Purulent infection, or septicemia, prevailed in England and Wales at a rate of 2.0 per 100,000

in 1934 and 0.7 in this country. The decline in the rate in the two countries during the last five years was about the same.

The cancer death rate in England and Wales was 156.3 per 100,000. For this country the rate was 106.3, a very marked difference. Cancer of the male genito-urinary organs prevailed at a rate of 17.7 in England and Wales and 9.0 in this country. This group includes the so-called mule spinner's cancer which prevails in England and Wales but not in this country. The mortality from cancer of the skin is about the same in the two countries, or 2.7 and 2.6 respectively.

The rate for rheumatic fever was 3.4 in England and Wales and 1.8 or about one-half, for this country. The English death rate declined from 3.8 in 1931 to 3.4, while in this country the decrease was from 2.5 to 1.8. This is a disease which requires careful medical supervision of the patient and prompt attention to his needs. The same is true of chronic rheumatism and osteoarthritis which prevailed in England and Wales at a rate of 7.8 compared with a rate of 1.3 for this country. The reasons for this marked difference are not fully understood but they are possibly partly climatic. Instead of a reduction in the rate there has been an increase in England and Wales from 7.5 in 1930 to 7.8 in 1934, while in this country the rate remained stationary.

Anemia-chlorosis showed a death rate of 6.6 for England and Wales and 3.1 for this country, or less than one-half. The rate increased in England during the last five years from 6.0 to 6.6, while in this country there was a decrease in the rate from 3.7 to 3.1.

Cerebral hemorrhage, apoplexy, etc., were much more common in the United States, the rate having been 85.5 in 1934 compared with a rate of 64.7 for England and Wales. The rate decreased in England and Wales from 65.0 to 64.7, and in this country from 88.8 to 85.5.

Other diseases of the nervous system show a decidedly higher rate for England and Wales, or 7.3 per 100,000 in 1934, compared with a rate of 3.1 for the United States. The reduction in the rate has been about the same for both countries.

Disease of the ear and mastoid sinus, the medical neglect of which is of serious consequence, prevailed in England and Wales at the rate of

4.1 in 1934 compared with 3.2 in this country. The rate has increased in England and Wales from 3.5 to 4.1, while the rate for this country declined slightly or from 3.3 in 1930 to 3.2 in 1934.

Acute endocarditis prevailed in England and Wales to the extent of 3.0 per 100,000 in 1934, and in this country at a rate of 2.8. Chronic endocarditis and valvular disease prevailed at a rate of 58.1 in England and Wales and 45.7 in this country. There was a reduction in the rate in England and Wales from 65.7 to 58.1, and in the United States from 56.1 to 45.7.

Diseases of myocardium are much more common in England and Wales than in this country, the rate having been 163.2 per 100,000 in 1934 in England against a rate of 108.1 for this country. There has been an increase in the rate in both countries, or from 120.9 to 163.2 in England and from 97.7 to 108.1 in the United States.

The rate for diseases of the coronary arteries and angina pectoris was 26.4 per 100,000 in 1934 in England and Wales and 42.8 in this country. The rate increased from 14.8 to 26.4 in England and from 24.1 to 42.8 in this country. The increase may possibly be the result of changes in classification for medical registration purposes.

For disordered action of the heart the rate in England and Wales in 1934 was 6.7 compared with a rate of 0.7 for this country. There was an increase in the rate from 5.3 in 1930 to 6.7 in 1934 in England and Wales and from 0.6 to 0.7 in this country.

Arterio-sclerosis likewise shows a decidedly higher figure for England and Wales, or 54.4 in 1934, compared with 18.0 for this country. While the rate increased in England and Wales during the last five years from 47.5 to 54.4, it decreased in the United States from 18.4 to 18.0.

Decidedly, here in the United States we do better *without* Health Insurance.

#### PROOF OF THE COST OF STATE MEDICINE LIES IN THE TAXES

The entire history of health insurance has proved that "sickness" is an indefinable condition which is often coveted by the insured person with no desire to get well.

The practice of medicine is mechanized unduly, personal responsibility diminished, diag-

nosis crippled, research hampered and so much time wasted on the urgencies of the would-be sick that none is left for the really disabled, under all tested forms of "Health Insurance" or "State Medicine."

*The lack of universally adequate medical care, moreover, results more from indifference on the part of the people than from economic or other reasons. The Metropolitan Life Insurance Company found in a house to house canvass of several thousand families that the majority of parents who had failed to have their children inoculated against diphtheria knew about the possible benefits, believed in preventive medicine but had simply neglected the matter. Would health insurance activate the will?*

#### DERMATITIS FROM DYED AND OTHERWISE TREATED CITRUS FRUITS: REPORT OF TWO CASES

The practice of coloring citrus fruits by means of dyestuffs, aniline and other substances to give a fully ripened appearance has come into vogue only during the last two to two and one-half years. Eugene F. Traub, Richard E. Gordon and Laird S. Van Dyke, New York (*Journal A. M. A.*, March 13, 1937), saw two patients with a dermatitis from handling such treated and dyed fruit. In both instances the dermatitis was caused by the chemically treated or dyed fruit, their patch tests in both patients indicating yellow O B dye as the prime offender. Evidently the dye and chemicals used did not penetrate even to the inside of the peel, as patch tests with the inner surface of the rind gave negative results. Patch tests with the meat of the fruit also were negative. Patch tests with dyed orange skin were repeatedly found to be positive. Patch tests with known undyed and untreated skins (Florida oranges) were negative. In case 1, patch tests with dyed orange peel produced actual blistering of the skin and a severe focal and general reaction. The dyes used on citrus fruits may definitely irritate some skins. These dyes are not general irritants, because the majority of individuals do not react to them. Hypersensitivity to the dyes may be acquired by constant and repeated exposure. A circumstance of case 1 for which the authors are unable to account on the basis of information supplied them and despite their many repeated tests is the positive reaction to undyed oranges from California. All known dyed fruit from Florida gave positive tests, while the fruit from this state which to their certain knowledge was undyed gave repeatedly negative tests. The fact that this patient regularly reacted negatively to orange skins that they knew were untreated and undyed and gave positive tests to the citrus fruits from California obtained on the market here certainly seems to incriminate some preparation used on the California oranges.



## MEDICAL ECONOMICS

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of the

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C. S. Skaggs, M. D.

The nearness of the annual meeting of the Illinois State Medical Society, makes any comment on medical matters a very careful procedure. Basic decisions as to the conduct of the Society are decided at the meeting by the House of Delegates. These decisions are binding on the Council for the ensuing year. As a result serious consideration might be given to one or two matters. One is the question of the amount of the annual dues. It is the natural desire to keep the dues at the lowest level compatible with the needs of the society. The last two years the dues have been the lowest of any large state medical society in the country. In spite of this fact, the activities of the Society have been continued as before. However, many of the members of the society feel that with improved economic conditions generally and affecting the medical profession particularly, it would cause no hardship on the medical profession to increase the dues for the next year by a small amount. Those who have their ear to the ground feel that during the next few years and possibly the coming one, the definite decision as to the future of medicine in the United States will be made. In order to familiarize the public with the opinion of the medical profession a campaign of publicity more extensive and intensive than ever before will be required. The best example of such a campaign is that being carried on under the supervision of the New York Medical Society. Such a campaign costs money but should be of inestimable assistance to the medical profession in maintaining the practice of medicine as it now is, a personal business run by the medical profession for the benefit of the public. A small increase in the dues will help greatly in planning and conducting such a campaign. It is to be hoped that the delegates will give careful consideration to this proposition and not be swayed by oratory or petty prejudices in arriving at a decision on this one of the chief decisions to be made at the meeting.

The annual meeting of the Secretaries Conference will be held at 9:00 A. M. Tuesday morning, May 18, with D. W. Killinger of Joliet presiding. The program will be given over to a consideration of the problems of running the medical organizations of the counties and state and should be attended by the officers of every county society. In addition the question of state and socialized medicine will be discussed by the outstanding men of the state. Those interested in these problems will find the program for this meeting complete in this journal. It is to be hoped that there will be a good attendance and that there will be free discussion. These meetings are held to answer the questions which are not covered by other means during the year. May we repeat the hope that there will be a large attendance at this meeting.

The Chairman of this Committee wishes at this time to thank every member of the state society, who has assisted during the past year in preparing material for his column. He wishes particularly to thank the Editor for his cooperation in editing and preparing the articles sent to him for printing. The Committee hopes that the work will be continued in the coming year and that the interest of the rank and file of the profession will increase in the work of the new Committee to be appointed immediately after the annual meeting.

An article by Past President Charles S. Skaggs of East St. Louis is presented this month for your attention. Dr. Skaggs is an able thinker and writer and we trust that his article will please you.

E. S. HAMILTON, *Chairman,*  
Medical Economics Committee.

## ETHICS VERSUS ECONOMICS

CHARLES S. SKAGGS, M.D.

Investigations have come into our social life as a result of our effort to deceive one another.

For a period of time this was confined to a few unscrupulous; but as these were exposed and others learned of how profitable it was and how long those engaged in it had been able to conceal their practice, they began to imitate and at each exposure there were more recurrences until now it has become a practice too large to deal with without the danger of upsetting our whole social and economic structure as well as our political setup. This is dangerous enough, but when you consider that when an investigation is asked for or demanded, an added danger is inserted that is far beyond description, if the investigation should happen to be an honest effort to reveal the facts.

To safeguard against these dangers and to promote the happiness and security of our people, investigations are now made for the purpose of better concealing the facts by the appointment of commissions composed of those who have by experience and study qualified themselves as experts in disseminating false propaganda and voluminous reports so worded that they are non-understandable and meaningless and there is absolutely no opportunity of detecting the facts which the commissions were appointed to ascertain.

At the time the medical profession first became fully acquainted with this condition, the report of the committee appointed to investigate the type and cost of medical service that was being used in the care of the sick of our country by the family physician was also made. Nothing need be said about the qualification of those making the majority report as to their qualification to render an opinion regarding those who had to do with the sick in their homes and private hospitals.

These men had trained themselves for a period of years by having no contact with the sick that were cared for by the family physician and by non-association with the private practitioner of medicine. By such training and study they were naturally qualified to make such an investigation and to make a report that would not contain the facts and would enlighten those who did not want to know the truth; also to arouse an ill feeling toward their doctor, by those who were served by the family physician. This had an effect upon medical ethics that has not been measured as yet. When one reviews the many attacks that have been made against the doctors

who bear the brunt of the practice of medicine, for the background of medical progress and maintain organized medicine, he must ask himself what is within these men that encourages and enables them to hold together and fight for the true principles of medical science and service.

It is this group that has maintained and fought for the true ethics of medicine and is determined to continue the fight and is revealing the truth about medical service at its own private expense. It is a well sounding statement that truth crushed to earth will rise again; but it must ever be remembered that truth crushed to earth will never rise unless some one lifts it up. Medical ethics are of the purest of truths. True it is that they have been crushed to earth, but they shall rise again to the glory of medicine because organized medicine will lift them up and again place them upon the pedestal from which they were taken by those of selfish greed.

Man cannot separate himself into parts and continue to function. Neither can medicine be separated into parts and continue to render an effective medical service. We must continue to live as a medical body regardless of our special interest. There are no special parts of medicine that continue to function without a continuity of the whole.

The musician may train his fingers to find the keys with lightning speed, yet long before these fingers mastered the art of speed and knowledge of place and touch other parts had done much work.

Ethics, in the true sense, is that which gives medicine poise, dignity and beauty. It must remain a part of medicine or all that is worthwhile will be lost.

Since economics has presented itself into our ranks we need ethics all the more. We can never solve the problem of economics without a high standard of ethics. Could any true physician be asked the price he had for saving a life? No form of economics must be permitted to mar the beauty of medicine. Our economic program must in the final adjustment blend with medical ethics.

The physician must ever be on his guard to prevent himself from becoming a stranger in the profession that he has created and this is a grave danger that confronts us at this time. Business must have a price tag but medicine dare not. To prevent this we must recultivate



our ethics and remove the weeds that have sprung up, the seed of which has been sown by those who looked only for profits.

I have felt from the first time I heard the expression, "The Cost of Medical Care," that danger was ahead. This statement has carried more undesirable things into the medical profession than any other group of words with which I am acquainted. It has even caused doctors to figure the cost of a visit to the sick and one well knows how foreign this is to medical thought, yet it has had a far reaching effect upon our modern ethics.

Why write about ethics? They are so simple and plain that no one will care to read what you write and they are just something that the other fellow should follow and have no application to me.

Is this not nearly true of most any subject about which one could choose to write? There are perhaps two reasons why anyone expresses his thoughts in writing today. The first incentive is probably the hope of being able to write something that will be poor enough to sell for money; the other a more selfish one, that by writing something that someone else might read, one may be sufficiently interested in the subject to learn something about it oneself.

I have, for a number of years, been interested in the subject or more correctly the question of economics and the more I learn about economics, the more I find that what I formerly thought economics pertained to, I realize it does not. I confess that at one time when I heard or saw the word "Economics" my first thought was money; but it is becoming hard for me to associate money with economics, for I now see that the fundamental principle upon which a stable economic system can be supported is a fundamental ethical standard that is conformatory to that rule set down nearly two thousand years ago.

Let me use that new meaning of an old word, "Refresher Courses." "Therefore, all things whatsoever ye would that men should do to you, do ye evenso to them, for this is the law and the prophets."

Then if we are to have an economics system that will support society and bring social security we must first return to an ethical standard that will permit such an economics system

to exist. To have height and depth we must have a level for them to have a beginning.

Why do we have medical ethics? This question was asked of his radio audience last November by Dr. Floyd S. Winslow. He then answered the question in his address. He made this statement in the beginning. "There is probably more popular misunderstanding on the subject of medical ethics than any other subject connected with the practice of medicine." Then he followed with another question. "What is this code of behavior to which the doctor is bound?" Does it operate for his benefit or for the benefit of the public? My answer to this last question has always been from the time I first understood it sufficiently to offer an answer, that anything that would benefit the doctor must first benefit the public.

Is there existing in the minds of any large number of physicians a misunderstanding of medical ethics? I am inclined to believe that there is not. There may be evasions of the code among many of us, but I question if it is due to the fact that we do not know what is right or wrong. Is it not done for selfish glory or greed? I confess openly that when I have stepped aside from this code it has been for this reason. Others may not have known but it is so simple to know that one must at least set up some resistance to the statement. Let's be charitable and grant it is true that there is some reason for one to write on this subject and to suggest that county societies should devote a few programs each year to the subject of ethics. For if we are to remain a free profession we must do and practice the principles that gave us our freedom. Ethics is what we do, not what we believe or say. It must be a principle that guides conduct and in my opinion medical ethics has to do with what is right and not what is wrong.

Dr. Richard Cabot is credited with the statement in Dr. Winslow's talk of saying "Most of what used to be called goodness has rightly fallen into disrepute because it is inefficient." Be this wholly or partially true the question of ethics remains the same. I am inclined to the opinion that a large part of what we once considered good has not been discarded because it was inefficient, but because it was a barrier to our selfish interest. Dr. Cabot reveals this in further saying that ethical diagnosis like physical diagno-

sis, has a practical end. This gives too much room for what you want and too little room for what really is, for there is a right and there is a wrong. I do not agree that medical ethics is an agreement between doctors so that each one knows what to expect of the other only in so far as they should know what the other should do. I agree that we have thrown overboard sufficient amount of the goodness of yesterday to cause people to say and think, why shouldn't I do as I please? Why should I be bound by rules or responsibilities to duty or customs, or to public opinions? Such thinkers say "I" never "We." Any student of society is convinced that such a rule of conduct cannot long exist. We cannot live in groups with these "I's" and we will not.

No one disputes the statement openly that the practice of medicine is a profession. We are all willing to be professional but many resent the fact that the prime object of our code of ethics is the service we can render. The fact remains that we assumed this obligation and we are duty bound to conduct ourselves in accord with these principles. On this rests our independence and freedom from government control, economic stability and progress of medical science. We have advanced medical science to the place it now is because we gave of our knowledge to each other. We can hold the public only by offering to them the benefits of this knowledge within their ability to give to us. Our service must never have a market value.

It has been said that the time has come when the doctor should be paid for his or her discoveries in medical science and some steps have been taken in that direction in a few instances. This has been frowned upon by the profession and rightly so. All that becomes new in medicine comes from that which is old in medicine. This has been the road on which the progress in medical science has travelled.

The sick have made their contribution to medical science. They have been our patients. They have suffered more and been sick longer when we knew less of our art. We cannot escape our obligation to our patients. 'Tis true they owe us much and if doctor and patient are left together they will solve their problems. No doubt there will be mistakes committed by both, yet these do not constitute a reason to separate doctor and patient. If this ever happens it

will be but a short period of time we will wait to realize that the reasons considered necessary to regimentate the doctor were but passing shadows compared to the clouds that will darken the medical horizon. The health of our people will be lost in the darkness of mistakes and soon the cry will go up, "Give us light to light the darkness."

Our loyalty for whatever we may add to medical science must ever be the royalty we receive from our medical co-worker.

The ethics of medicine must be from patient and doctor, a loyal relationship. The physician must let his patient understand that his money cannot heal him. The patient must let his physician know that he will contribute to the best of his ability to minister to the physician's financial needs so that he can always be able to advance his knowledge and thus serve his patient better when sick. This is the relationship for which the medical profession is striving. The doctor cannot harm his patient and escape harm to himself and the same is true of the patient.

Medical ethics must not be designated as the Chinaman said of our Christian Religion, "Christianity is a very talky religion." Our ethics must be our conduct and not our talk. We have in the past decade suffered much from the epidemic of alibi. It has infected society in all its branches. We have become experts in excuses. Power can only be used to destroy its strength. The medical profession has power. It knows this and it further knows that this power rests in better service to the sick. Our only weakness is that we are not standing together as we should to protect our rights in the delivery of our service.

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## Correspondence

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### BEG YOUR PARDON

Chicago, Ill., April 15, 1937.

*To the Editor:* In the April, 1937, issue of the Illinois Medical Journal, page 288, you have entered my name as one of those intending to be present at the dinner, given in honor of Dr. Carl E. Black of Jacksonville, Illinois. You have put me down as Associate Professor of Surgery at Northwestern University Medical School. I am, and have been for some time, Clinical Professor of Surgery at Rush Medical College,



and I would thank you to make the appropriate correction.

Kellogg Speed, M. D.

#### ALUMNI ASSOCIATION, COLLEGE OF MEDICINE, UNIVERSITY OF ILLINOIS

Your officers extend a most cordial invitation to very alumnus and member of the faculty of our Alma Mater who attends the Illinois State Medical Meeting to come to our annual Alumni luncheon, which will be held this year at the Pere Marquette Hotel, Peoria, Wednesday, May 19, 12 o'clock noon. This is always a good reunion.

Good food, a good program and a good time are assured. The local committee in charge of arrangements, Drs. K. N. Petri, W. A. Malcolm and E. C. Kelly are anxious to make arrangements for you. Please aid them by purchasing your tickets early. They may be procured at the registration desk at the meeting of the Illinois State Medical Society.

CHARLES H. PHIFER, *Chairman.*

#### WASHINGTON UNIVERSITY ALUMNI- MEDICAL SCHOOL

There will be a Washington University Medical Alumni reunion on Wednesday, May 19, at the Pere Marquette Hotel, on the occasion of the Illinois State Medical Society meetings. The exact time has not yet been set, but this information can be obtained when registering at the meeting. It is hoped that there will be a good turn-out, and Washington University alumni are urged to be on hand for their School's "get-together."

NANCY L. BLAIR, *Executive Secretary.*

#### INTERNATIONAL CONGRESS OF RADIOLOGY

One of the most outstanding scientific events ever held in the United States has been set for Chicago this September, when the Fifth International Congress of Radiology convenes. It will be the first time that the world leaders in the medical and scientific development field of x-ray and radium have met in America, according to Dr. Arthur C. Christie, Washington, D. C., president of the Congress. The dates are September 13 to 17, inclusive, and the meeting place is the Palmer House.

At least 500 distinguished delegates and guests from a score of European countries as well as physicians from Mexico, Canada and Central and South America are expected to attend, with more than 2,000 other

delegates and visitors from all parts of the United States.

The annual medical conventions of the leading radiological bodies of this country will be merged with the international congress. These include the American Roentgen society, the American College of Radiology, the Radiological Society of North America and the American Radium society.

The first International Congress of Radiology convened in London in 1925. Meetings are held every three years. The physicians and physicists met in Stockholm in 1928, in Paris in 1931 (where they paid tribute to the then living Madame Curie, co-discoverer of radium) and in Zurich in 1934.

Leaders in other branches of medicine will participate in the Congress. "The Unity of Medicine" will be the theme of the entire Congress.

"These international congresses seek to maintain a continuity of program over the years, and in consequence such vital subjects to the radiologist (and to the general public) as diagnosis and treatment of cancer and many other diseases and teaching and training in radiology will be on the agenda of this congress as well as at former meetings.

"Radiology is an important branch of medicine, and is indeed part of the entire tree, and not merely a specialty as it was once regarded," added Dr. Christie.

More than 250 scientific papers will be read at the five-day meeting. These will be delivered in each lecturer's own language and will be automatically flashed on screens in English, German and French as the papers are read.

What will probably be the greatest scientific and technical exhibit in the history of a radiological congress will be assembled by physicians, physicists and manufacturers of such equipment in conjunction with the congress.

The general secretary of the congress, Dr. Benjamin H. Orndoff, is in charge of headquarters at 2561 North Clark Street, Chicago, Ill.

#### HYPERTHYROIDISM MASKED BY SYMPTOMS OF ACUTE ABDOMINAL CATASTROPHE

William E. Robertson, Michael G. Wohl and Harold F. Robertson, Philadelphia (*Journal A. M. A.*, Feb. 20, 1937), consider instances in which the acute symptoms and signs referable to the abdomen are due entirely to the overactivity of the thyroid. The symptoms referable to the abdomen may be so severe as to suggest a surgical catastrophe. In two of three such cases the abdominal signs mimicked acute appendicitis. One of these patients was operated on and a normal appendix was found. The pains in the third patient were localized in the left upper quadrant of the abdomen. Post-mortem examination showed no abdominal pathologic condition to account for the pains. Differentiation is not always possible, since hyperthyroid patients may harbor lesions of the gastro-intestinal tract. When appropriate therapy is applied, the abdominal symptoms disappear with other signs of hyperthyroidism. In the surgical cases the signs and symptoms usually progress.

# THE ILLINOIS STATE MEDICAL SOCIETY

Organized 1850

## Eighty-Seventh Annual Session

Hotel Pere Marquette, Peoria, Illinois

May 18, 19, 20, 1937



Registration Bureau at the Official Headquarters—  
All Technical and Scientific Exhibits at the Pere Marquette.  
All General Sessions and Section Meetings under one roof.

### PROGRAM

Dr. Rolland Lester Green,  
President.

Picturesque Peoria — Conven-  
tion City.

Invitations to Peoria.

President's Dinner:

Ball Room,  
*Wednesday, 7 P. M.*

Veteran's Service Dinner:

Pere Marquette,  
*Tuesday Evening*

The Stag:

Ball Room, *Tuesday, 9 P. M.*

House of Delegates:

*Tuesday, 3 P. M.*  
*Thursday, 9 A. M.*

General Sessions:

*Tuesday, 1 P. M.*

Oration in Medicine:  
1:30 P. M.

Oration in Surgery:  
*Wednesday, 11 A. M.*

President's Address:  
*Wednesday, 1:30 P. M.*

Induction of President-elect,  
Rollo K. Packard.  
*Thursday, A. M.*

Secretaries' Conference:  
*Tuesday, 9 A. M.*

Conference on Diseases of  
Children:

Vogue Room,  
*Tuesday, 9 A. M.*

Pediatric Papers (See Sec-  
tion programs.)

Obstetricians and Gynecolo-  
gists Meeting:

*Tuesday, 9 A. M.*

Women Physicians' Activities:

*Tuesday, 9 A. M.*  
*Tuesday, 6:30 P. M.*

Central States Society of In-  
dustrial Medicine and Sur-  
gery:

*Tuesday, 9 A. M.*

Woman's Auxiliary:

Jefferson Hotel, Ball Room,  
*Tuesday, 9 A. M.*

Section on Medicine:

Pere Marquette, Ball Room,  
*Tuesday, 2:30 P. M.*  
*Wednesday, 9 A. M.,*  
*2:30 P. M.*  
*Thursday, 9 A. M.*

Section on Surgery:

Early American Room,  
*Tuesday, 2:30 P. M.*  
Ball Room,  
*Wednesday, 9 A. M.*

Early American Room,  
*Wednesday, 2:30 P. M.*

Ball Room,  
*Thursday, 9 A. M.*

Section on Eye, Ear, Nose and  
Throat:

Creve Coeur Room,  
*Tuesday, 9:30 A. M. and*  
*2:30 P. M.*

*Wednesday, 9 A. M. and*  
*2:30 P. M.*

Ball Room,  
*Thursday, 9 A. M.*

Section on Public Health and  
Hygiene:

Jefferson Hotel,  
*Tuesday, 2:30 P. M.*  
*Wednesday, 2:30 P. M.*

Pere Marquette, Ball Room,  
*Thursday, 9 A. M.*

Section on Radiology:

Vogue Room,  
*Tuesday, 2:30 P. M.*  
*Wednesday 9 A. M. and*  
*2:30 P. M.*  
*Thursday, 9 A. M.*

Scientific Exhibits:

Pere Marquette Hotel.





ROLLAND LESTER GREEN, M. D.  
PRESIDENT, ILLINOIS STATE MEDICAL SOCIETY, 1936-1937

## PICTURESQUE PEORIA



Pere Marquette Hotel  
Convention Headquarters



Peoria  
Country Club

*Lenard*  
1938





Peoria—The Convention City



The Methodist Hospital



St. Francis Hospital—Two Views



Peoria State Hospital





Above—Jefferson Hotel  
At Right—Bradley College  
Below—Industrial Photo



View from Grand View Drive



## PEORIA

Peoria, the bright spot on the nation's business map, offers a warm hand of hospitality to all its visitors. Founded centuries ago as an Indian village, it became the first permanent settlement of white men in Illinois when in 1680 the French explorer La Salle built old Fort Creve Coeur.

Slowly, perhaps, but very surely this favored spot became an important center in the development of the new world. First it was a French settlement, then a British fort, and finally an American frontier town.

Today Peoria is a modern city of 115,000 population; a city of contrasts, a city bustling with life and moving forward with the quick step of youth—yet a city proudly conscious of its rare and beautiful heritage. Your first impression of Peoria, in all probability, pictures a city busy with industry and commerce—modern stores serving a wide area are the equivalent of those found in a city twice Peoria's size, factories along the river front, warehouses, hotels, office buildings teeming with light and life. This is Peoria dressed in its work clothes.

But as you learn more about Peoria you will discover that behind this lies the real charm of the city. Here are fine churches and schools, a beautiful college, an art institute and a "little theater" with its own play house, and many organizations devoted to the religious, cultural and social advancement of the community. Peoria homes reflect these intellectual attainments.

Peoria offers ample opportunity for play. It is the site of many of the nation's major sporting events and has long been known as the bowling capital of the world.

Golf on championship links, motor boating, sailing, fishing, swimming and tennis give Peoria a full program of summer sports. Professional baseball, boxing, wrestling and interesting collegiate athletics round out Peoria's sports calendar.

The shores of the Illinois River both above and below the city draw duck hunters from a broad territory. The wooded hills of the river valley make possible a wide variety of small game hunting and constitute a naturalist's paradise.

Many modern theaters present the newest attractions in screen and stage entertainment. A visitor to Peoria will thrill to the beauty of

the city's magnificent parks. He will be profoundly impressed with the breathtaking grandeur of the broad Illinois valley, as seen from Grand View Drive which Theodore Roosevelt called "The world's most beautiful."

Peoria is in the heart of one of the richest agricultural sections of the mid-west. There are many interesting side trips from the city through the rolling and well wooded by-ways of central Illinois.

It is natural that Peoria should be a popular convention city. Its central location and ease of accessibility, together with its distinctive hotels, adequate halls and meeting places and the charm of the city itself, attract thousands of convention visitors yearly.

More than two thousand different products are manufactured in Peoria's two hundred factories. This great diversity of industry probably accounts for Peoria's consistent prosperity as much as any other factor.

Here you will find the world's leading tractor concern, the largest distilleries in the world, one of the largest breweries in the country, large washing machine factories, an immense steel and wire mill, extensive farm machinery companies, and many others.

Peoria's location in the center of a great market, its nearness to raw materials and fuel, its unlimited pure water supply of uniform temperature, and its adequate shipping facilities make it an outstanding industrial center, destined to grow greater.

Peoria is served by every modern means of transportation. Fifteen rail lines enter the city. Frequent, scheduled air service stopping at Peoria's new modern airport brings the city within forty-five minutes of Chicago and St. Louis. Peoria is located on the Great Lakes to the Gulf waterway and with the facilities of a modern river and rail terminal has the advantages of water transportation. Peoria is in the very center of the Illinois network of paved highways.

These many forms of transportation not only serve industrial Peoria but also establish the city as an important grain and livestock market.

**AIRPORT**—200-acre modern Airport 5 miles from Court House on new paved highway. Regular air mail, passenger and express service provided. 5 transport planes scheduled through



Peoria daily by American Airlines and Chicago and Southern Air Lines.

AMUSEMENT—10 modern theaters present the latest stage and screen attractions.

AREA OF CITY—12.28 square miles.

ART INSTITUTE—Cultivates interest in art; conducts classes in drawing, painting, sculpturing and photography.

ARMORY—Illinois National Guard Armory. Seats 7,500. 18,000 square feet of floor space.

ASSESSED VALUATION—1935 (city) \$77,615,953.

BANKS—Greater Peoria has 4 national and 3 state banks. Clearings in 1935, \$147,301,419.84. Debits, \$538,792,466.00. Deposits, July 1, 1936, \$57,678,864.09 (all time high). Time deposits, \$17,291,224.87.

BUILDING AND LOAN—Peoria has 9 associations, total assets \$28,767,283.25. Number of loans 8,566.

CHURCHES—Peoria has 109 churches including every denomination.

CITY PLAN—Of comprehensive nature provides for future streets, zoning, transportation, recreation, transit, civic center, school sites and park locations.

CITY GOVERNMENT—Aldermanic form. 20 aldermen and mayor.

CLIMATE AND TEMPERATURE—1935 year-round temperature average 50.8°. Climate mild. Rainfall 40.15 inches.

CLUBS—11 clubs, all having weekly luncheon meetings. 5 music clubs, 3 country clubs, 9 other clubs with buildings of their own, or permanent headquarters.

COAL MINING—Peoria and Tazewell counties have 83 local mines and 6 shipping mines, annual output 1,864,692 tons. Men employed, 2,387.

COMMUNITY FUND—22 agencies participate in fund raised annually. 1935—\$169,000.

DISTILLERIES—Peoria is the largest distilling center in the world, having an annual capacity of 84,000,000 gallons on which the Federal tax would be approximately \$200,000,000.00.

EDUCATION—Public schools: 24 elementary, 2 junior high; 3 high schools. Parochial schools: 9 elementary, 2 high schools. Business colleges—3. College: Bradley Polytechnic Institute. Teachers in all public schools 350 to 400. Value of public school property—\$6,201,209.

ELECTRIC METERS—34,000 in active service July 2, 1936.

FIRE PROTECTION—Fire Department ranks with best in cities of Peoria's size. 10 stations. 127 men. 15 pieces motorized equipment.

GAS METERS—26,500, July 1, 1936. Natural gas piped to Peoria and abundantly available.

GOLF—2 18-hole private courses. 3 18-hole municipal courses.

GRAIN MARKET—The Peoria Board of Trade, organized in 1857, one of the nation's large primary grain markets. Received nearly 25,000,000 bushels of grain in 1935, including nearly 15,000,000 bushels of corn.

HOSPITALS—4 hospitals—683 beds—4 nurses training schools. Municipal Tuberculosis sanitarium, 100 beds. 1 private sanitarium. State Hospital for Insane, 2,550 inmates.

HOTELS—2,000 modern hotel rooms. Adequate convention facilities.

HOUSING—26,205 dwelling units in city limits, more than half of which are occupied by owners.

ILLINOIS RIVER—Deep waterway passes Peoria and with a modern river and rail terminal provides the city with water transportation. 89,455 tons of freight were handled in 1935. The new \$2,350,000 dam and lock to be constructed 4 miles below Peoria will maintain the 9-foot navigation channel which is 100 feet wide.

INDUSTRIES—174 principal industries, with investment of \$180,000,000. Annual payroll (1935) \$28,000,000. Approximately 21,000 industrial employees—nearly 1,000 different products.

LITERACY—Peoria tied for first place among all cities of the nation.

LIVE STOCK MARKET—Modern stock yard, considered one of the world's largest truck-in markets, received in 1935, 406,400 hogs, 68,000 cattle, 53,400 calves, 95,100 sheep. Total business \$20,000,000.

MAIL POSTAL SERVICE—Is provided by 6 railroads and two airlines. A new Federal Building will soon be under construction. 204 postal employees each day provide three deliveries for the downtown section and two for residences.

**MANUFACTURED PRODUCTS**—Have an annual value of 350 to 400 million dollars and include agricultural implements, alcohol and solvents; beer and liquors; brick, tile and stone; caskets; castings; chemicals; cooperage; cordage; cotton goods; fencing and wire products; food, dairy and meat products, feeds; furnaces and oil burners; harvesters and road machinery; household products; millwork; paper products; printing and lithographing; steel products; strawboard; tools and dies; tractors; transparent wrappers; threshers; and washing machines.

**MOTOR BUS LINES**—Of which there are 9 give daily passenger service to all midwest communities. Through lines to Chicago, St. Louis, Kansas City, Los Angeles and Indianapolis. Connections with all important lines.

**MOTOR TRUCK LINES**—8 trunk lines and 100 other lines. Regular service to 100 midwest cities, and direct connections to all points.

**MUSIC**—Many organizations and groups sponsor programs of culture. Orpheus Club, Amateur Music Association and Public School music are recognized nationally.

**NEWSPAPERS** — Morning daily, Peoria Transcript; evening daily, Peoria Star and Peoria Journal; Sunday, Peoria Star and Peoria Journal-Transcript.

**PARKS**—8 public parks with total of 1,637 acres provide all forms of recreation including swimming, scenic drives, golf, tennis and boating.

**PEORIA PLAYERS** — Amateur theatrical society; own fully equipped theater.

**POLICE PROTECTION**—Peoria police department of 121 men rated as one of country's most efficient and best equipped by United States Department of Justice. Maintains 9 two-way radio police cars.

**POPULATION**—1930—104,969; 93.6% native born. 1936 (est.) 112,000; metropolitan area (est.) 155,000; trading area (est.) 323,500.

**POST OFFICE RECEIPTS**—1935, \$914,750.

**POWER**—Total output 1935 (residence and industrial) Greater Peoria electricity—199,394,000 kilowatt hours. Gas—939,315,000 cubic feet.

**PROFESSIONS**—192 attorneys; 108 dentists; 165 physicians.

**PUBLIC LIBRARIES** — 208,000 books;

28,470 card holders; circulation in 1935—798,191.

**RADIO STATION**—WMBD frequency 1,440 kilocycles, on air 18 hours each day; CBS outlet for Central Illinois.

**RAILROADS**—Terminal point for 14 steam and one electric railroad. Major eastern, western and southern roads serve Peoria direct, providing through rates to all territories. Alton Railroad Company; Big Four Route; Chicago, Burlington and Quincy Railroad Company; Chicago and Illinois Midland Railway Company; Chicago and Northwestern Railway Company; Illinois Central System; Illinois Terminal Railroad System; Minneapolis and St. Louis Railroad Company; Nickel Plate Road; Peoria and Pekin Union Railway Company; Pennsylvania Railroad; Peoria Terminal Company; Rock Island Lines; Santa Fe Railway Company; Toledo, Peoria and Western Railroad.

**RETAIL SALES**—Peoria County annually—\$70,362,000. Peoria County per capita—\$670.

**RECREATION CENTER**—Maintained by Park board. Modern in every respect.

**SANITATION**—Entire city's sewage disposed of through modern disposal plant.

**SCHOOL ENROLLMENT**—Public schools, 17,024; parochial schools, 2,513; Bradley College, 1,390.

**STREET CAR AND BUS SERVICE**—137 modern units give efficient service to all parts of Greater Peoria.

**STREETS AND HIGHWAYS**—100 miles of paved streets, including many scenic drives. National and State hard surfaced highways pass through Peoria and radiate in every direction.

**SYMPHONY ORCHESTRA**—40 members; founded in 1898.

**TELEPHONES**—24,000.

**WAREHOUSE FACILITIES** — Modern warehouses adequately available.

**WATER METERS**—Approximately 24,000.

**WATER SPORTS**—Boating, swimming, yachting, canoeing on Illinois River and Peoria Lake.

**WATER SUPPLY** — Abundance of pure water from artesian wells. Daily plant capacity 30,500,000 gallons. Mineral content 450 parts per million gallons.



## PEORIA CITY MEDICAL SOCIETY

PEORIA, ILLINOIS

*To All Members of the Illinois State Medical Society:*

The Peoria City Medical Society extends heartiest greetings. We wish to invite you to attend the Eighty-seventh Annual Meeting of the Illinois State Medical Society which will be held in Peoria on May 18th, 19th and 20th.

Nothing has been left undone to make your visit enjoyable and profitable. The program which has been planned is outstanding and the scientific exhibits will far surpass any previous presentation.

Our Society is pledged 100% to serve you in any capacity and we look forward to your visit with anticipation. Come early and let us all make this Eighty-seventh Meeting the best of all.

Faternally,

E. A. GARRETT, *President.*

C. W. MAGARET, *Secretary.*

Peoria City Medical Society.

#### INVITATION FROM COMMITTEE ON ARRANGEMENTS

The Committee on Arrangements invites each and everyone of you to be among the two thousand or more that we expect at the Annual Illinois State Medical Meeting, May 18-19-20, at Peoria.

The Pere Marquette Hotel is the official hostelry. At the Registration Booth you will obtain the Official Program, special parking privilege stickers for your automobile, a list of nearby parking places, free stag tickets and an invitation to be a guest of the "World's Largest Distillery."

The Stag which will be very interesting and unusual will be held in the Ball Room of the Pere Marquette Hotel on Tuesday, May 18, at 9:00 P. M. The Stag Chairman states that there will be nothing offensive to anyone, but any additional information is unobtainable.

Many of the luncheons and the President's Dinner on Wednesday evening in the Ball Room will be held at the Pere Marquette Hotel.

We are informed from reliable sources that the Scientific Exhibits will be better than at any time. There will be many Commercial Exhibits of unusual interest. Both the Scientific and Commercial Exhibits will be in the Pere

Marquette Hotel. The Scientific sections to be held in Pere Marquette Hotel are:

Eye, Ear, Nose and Throat in Creve Coeur Room.

Radiology in Vogue Room.

Surgery in Early American Room.

Pediatrics in Vogue Room, Tuesday a. m.

Central State Society, Industrial Medicine & Surgery in Early American Room, Tuesday a. m.

Secretaries Conference in Ball Room, Tuesday a. m.

Medicine and General Sessions in Ball Room.

Public Health and Hygiene section, Jefferson Hotel.

The slogan is "See You in Peoria," and the Committee on Arrangements welcomes you.

E. C. KELLY,

General Chairman.

#### PRESIDENT'S DINNER

Every member of the Illinois State Medical Society present at the Annual Meeting should endeavor to attend the President's Dinner which will be held in the Ball Room of the Pere Marquette Hotel on Wednesday evening, May 19, at 7:00 o'clock. The guest of honor at this important function is Dr. Rolland Lester Green, President of the Society for the past year.

Dr. Charles B. Reed, the immediate past president, will act as toastmaster. All living past presidents are guests of the Society, and are especially urged to be present.

Dr. Philip H. Kreuscher, Chairman of the Council, will present the retiring President with the President's Certificate following the dinner service. No other speeches will be made during the evening.

Following the dinner, the President's Dance will be given with a good orchestra to furnish the music for all lovers of the Terpsichorean Art. The bridge fans will also be cared for, and prizes will be awarded to the winners.

DO NOT FORGET THE PRESIDENT'S DINNER.

#### VETERANS' SERVICE COMMITTEE DINNER

The annual dinner of the Veterans' Service Committee will be held in the Hotel Pere Marquette on Tuesday evening, May 18. Dr. F. O. Fredrickson, Chairman of the Committee, will

officiate as presiding officer for this event. Every physician is cordially invited to attend this dinner meeting whether an ex-service man or not, for the program will be of general interest.

#### Program

"The Medical Commission and Organized Medicine"—Norman L. Sheeche, M. D., Department Surgeon, Department of Illinois American Legion.

"The Organization of the Medical Service of the Army in War"—Roy C. Hellebower, Col. M. C., U. S. A. District, Illinois 6th Corps Area.

"The American Legion's Contribution to the Boys' State and Big Brother Movement"—Leonard Applequist, Senior Vice-Commander, American Legion.

Department Surgeon Norman L. Sheeche, M. D., will call a meeting of the Medical Commission immediately following the dinner program. The place of the meeting will be announced later.

#### THE STAG

The Peoria City Medical Society invites all physicians and their male friends to be their guests at the annual "STAG" to be held in the Hotel Pere Marquette Ball Room at 9:00 P. M., Tuesday evening, May 18th. The Committee is reluctant to give any advance information concerning the nature of the entertainment, but they state that it will be of interest to all members and guests, and that no one will be offended.

#### ALUMNI AND FRATERNITY LUNCHEONS

All Alumni and Fraternity luncheons will be held Wednesday noon, May 19th. Special information concerning these events will be posted on bulletin boards, and tickets will be available at the Registration headquarters, and also from members of the local committee from the Peoria City Medical Society.

#### MEETINGS OF THE HOUSE OF DELEGATES

##### *Tuesday Afternoon, May 18, 1937*

- 3:00 First Meeting of the House of Delegates, called to order by the President, Rolland L. Green, for Reports of Officers, Councilors, Committees, appointment of Reference Committees, introduction of resolutions, and for the transaction of other

business which may come before the House.

##### *Thursday Morning, May 20, 1937*

- 9:00 Second Meeting of the House of Delegates, called to order by the President for the Election of Officers, Councilors, Committees, Delegates and Alternates to the American Medical Association, Reports of Reference Committees, and action on same, and for the transaction of other business to come before the House.

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#### GENERAL SESSIONS

##### OPENING MEETING

##### *Tuesday Afternoon, May 18, 1937*

- 1:00 Eighty-seventh Annual Meeting officially opened by the President, Rolland L. Green.
1. Invocation. William Adkinson Young, 1st Presbyterian Church, Peoria.
  2. Address of Welcome—Mayor of Peoria, Hon. David H. McCluggage.
  3. Address of Welcome—President of the Peoria City Medical Society, E. A. Garrett.
  4. Report of Chairman of the Committee on Arrangements, E. C. Kelly.
  5. Adjournment for Oration in Medicine.
- 1:30 Oration in Medicine, "Abdominal Visceral Pain: A Physiological and Clinical Consideration" . . . . . Virgil E. Simpson, Louisville, Ky.

##### *Wednesday Morning, May 19, 1937*

- 11:00 Oration in Surgery, "Early Treatment of Injuries of the Face and Jaws." . . . . Vilray P. Blair, St. Louis, Mo.

##### *Wednesday Afternoon, May 19, 1937*

- 1:30 President's Address, "Self-Preservation." Rolland L. Green, President, Illinois State Medical Society, Peoria, Ill.

##### *Thursday Morning, May 20, 1937*

Induction of the President-Elect.

Immediately after the closing of the meeting of the House of Delegates, Rollo K. Packard will be inducted into the office of President of the Illinois State Medical Society by the retiring



President. All members and guests are urged to attend this interesting function.

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#### SECRETARIES' CONFERENCE

Donald W. Killinger, *Chairman*.....Joliet  
John W. Long, *Vice-Chairman*.....Robinson  
D. D. Monroe, *Secretary*.....Alton

*Tuesday Morning, May 18, 1937*

9:00—12:00

Call to Order and Opening Remarks.....

.....Donald W. Killinger, Chairman, Joliet

"Retrospect and Prospect".....

.....Rolland L. Green, President, Illinois State Medical Society, Peoria

"Correlation of Secretarial Duties in the State Medical Society".....

.....Harold M. Camp, Secretary, Illinois State Medical Society, Monmouth  
Questions and Answers.

"How May the County Medical Society Aid in the Rendition of Township Relief".....

.....Mr. John Beineman, Oak Hill, Illinois. Chairman of the Board of Supervisors of Peoria County  
Discussion opened by A. R. Brandenberger, Secretary of Vermilion County Medical Society, Danville.

"State Medicine".....John R. Neal, Chairman, Legislative Committee, Illinois State Medical Society, Springfield

"Socialized Medicine".....Robert H. Hayes, Secretary, Chicago Medical Society, Chicago

"What the Scientific Service Committee Has to Offer County Medical Societies".....Robert S. Berghoff, Chairman, Scientific Service Committee, Chicago.

Questions and Answer Period for County Society Secretaries.

Annual Election of Officers of Secretaries' Conference.

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#### A CONFERENCE ON DISEASES OF CHILDREN

Arthur H. Parmelee, *Chairman*.....Oak Park  
Joseph K. Calvin, *Vice-Chairman*.....Chicago  
Gerald M. Cline, *Secretary*.....Bloomington

*Tuesday Morning, May 18, 1937*

VOGUE ROOM

#### A SYMPOSIUM ON PNEUMONIA

9:00—"General Introduction, Etiology and

Classification"...Joseph Brenneman, Chicago

Differences between Pneumonia in Childhood and in the Adult; the Etiology of Pneumonia in Childhood together with the different types of pneumonia and their chronological and clinical setting; Lobar, Bronchial, Interstitial and Lipoid.

Discussion opened by Scott Wilkinson, Decatur.

9:45—"Symptomatology and Diagnosis"....

.....W. L. Crawford, Rockford

Pneumonia in the infant. Pneumonia in the older child. Symptomatology of lobar pneumonia; of broncho-pneumonia; of mixed forms. Symptoms and diagnosis of lipoid pneumonia. Symptoms in central or masked pneumonias with late appearance of physical signs. Differential diagnosis. Illustrated with slides.

Discussion opened by Fred Maurer, Peoria.

10:30—"Complications, Sequelae and Prognosis".....

.....John R. Vonachen, Peoria

Difference in Complications and Sequel as related to the difference of pneumonias both as to bacteriology and pathology.

Also difference in complications and sequel following different types of pneumonia. Special reference to Complications and Sequel following staphylococcus pneumonia, and also influenzal pneumonia.

Also Lung Abscess as an oftentimes unrecognized sequel. Prognosis. Recognizable types and their relationship to early diagnosis, treatment and ultimate recovery.

Discussion opened by Walter Whitaker, Quincy.

11:15—"Treatment"...Joseph K. Calvin, Chicago

Prophylaxis by proper treatment of minor febrile respiratory ailments. Active therapy: Absolute rest and methods of securing it in children; Hydrotherapy for control of fever and restlessness; Isolation; Nursing care; Control of dehydration and ketosis. (Type of fluids, quantities, route of administration, etc.); Diet suitable for children; Control of Tympanites; Types of stimulation, various drugs, etc: Indication for Oxygen, Blood Transfusions, Specific Therapy; Treatment of complications as otitis media and empyema.

Discussion opened by King Woodward, Rockford.

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#### PEDIATRIC PAPERS BEFORE OTHER SECTIONS

*Tuesday Morning, May 18, 1937*

##### OBSTETRICS AND GYNECOLOGY

"Icterus of the Newborn".....

.....Craig D. Butler, Chicago

*Tuesday Afternoon, May 18, 1937*

##### SECTION ON MEDICINE

"Whole Suprarenal Gland—A Useful Therapeutic Agent" (Lantern Slides).....

.....Orville Barbour, Peoria

## SECTION ON EYE, EAR, NOSE AND THROAT

## "Round Table Discussion".....

Groups 1 and 2 discussion Middle Ear and Mastoid Diseases in Infants and Children; also Sinus Infection in Children.

## SECTION ON RADIOLOGY

## "Value and Limitation of Encephalography"

.....Abraham Levinson, Chicago

## SECTION ON PUBLIC HEALTH AND HYGIENE

## "Whooping Cough Diagnosis and Prevention"

.....L. Sauer, Evanston

## "Poliomyelitis"...Archibald L. Hoyne, Chicago

*Wednesday Morning, May 19, 1937*

## JOINT SESSION—SECTIONS ON MEDICINE,

## SURGERY AND RADIOLOGY

## "Surgical Treatment of Appendicitis in Children".....Edwin M. Miller, Chicago

## "Diagnosis of Appendicitis in Children"...

.....H. W. Elghammer, Chicago

## SECTION ON EYE, EAR, NOSE AND THROAT

## "Report on Periodic Examination of School Children".....G. Harmon Brunner, Glencoe

*Wednesday Afternoon, May 19, 1937*

## SECTION ON MEDICINE

## "Scarlet Fever and Its Complications".....

.....Eberhardt H. Quandt, Rockford

## SECTION ON PUBLIC HEALTH AND HYGIENE

## "Diphtheria Prevention—A Municipal Problem".....N. C. Bullock, Rockford

## SECTION ON RADIOLOGY

## "Some Roentgen Considerations of the Childhood Type of Tuberculosis"...Earl E. Barth,

.....Northwestern University, Chicago

*Thursday Morning, May 20, 1937*

## JOINT SESSION—SECTIONS ON MEDICINE; SUR-

## GERY; EYE, EAR, NOSE AND THROAT;

## PUBLIC HEALTH AND HYGIENE;

## RADIOLOGY

## "The Fundamentals of Serum Therapy"....

.....Winston H. Tucker, Springfield

## "Human Convalescent Serum and Its Application to Acute Infectious Diseases".....

.....Sidney O. Levison, Chicago

## "The Control of Rabies".....

.....Maurice L. Blatt, Chicago

## OBSTETRICIANS AND GYNECOLOGISTS' MEETING

Ralph A. Reis.....*Chairman*

Floyd L. Heinemeyer.....*Secretary*

*Tuesday Morning, May 18, 1937*

9:00—"Diagnosis and Treatment of Occiput

Posterior Position"...William Cooley, Peoria

Occiput posterior position occurs more frequently than was formerly thought. Early diagnosis is important in order to institute proper treatment as soon as possible.

Discussion opened by Thomas Bell Williamson, Mt. Vernon.

9:30—"Treatment of Non-Convulsive Toxemia".....William Dieckmann, Chicago

The importance of the various symptoms and signs of toxemia will be discussed. The treatment used for the ambulatory cases of toxemia and also for those who are hospitalized will be discussed.

Discussion opened by Wm. A. Michael, Peoria.

10:00—"Endometriosis".....Fred O. Priest, Chicago

Endometriosis, though relatively recently brought to our attention, is now recognized as one of the common new growths. It demands the consideration of each of us who does surgery in the female abdomen or pelvis, or treats conditions dealing with its physiology.

The typical symptomatology plus the characteristic puckering of these growths, where palpable, aid greatly in making the diagnosis. The choice of treatment must depend upon the age of the patient and location and extensiveness of the growth.

Discussion opened by George W. Stephenson, Bloomington.

10:30—"Maternal Welfare Committee Report".....Fred H. Falls, Chicago

This report will cover the relationship of the Illinois State Department of Public Health and the Childrens Bureau; the advisory function of the American Committee on Maternal Welfare; the relationship of the Illinois State Medical Society through its program committee; the activities of the Department of Obstetrics of the University of Illinois, and other Medical Colleges in Chicago; the organization of Refresher courses throughout the state; the proposed summer courses at the University of Illinois; the co-operative activities of lay organizations, such as the Federation of Womens Clubs, Visiting Nurses Associations, Parent Teachers Association and the University of Illinois Extension Division. This discussion will be supplemented by an exhibit in the scientific exhibit section setting forth these facts graphically.

10:40—"Third Stage of Labor".....Holland Williamson, Danville

This paper discusses the management, mechanism and characteristics of the third stage of labor in the normal case, in caesarean section and in premature separation of the placenta. The use of ergot alkaloids are discussed in their relation to the third stage. A case of retained placenta is reviewed in which placenta accreta was considered. Gentleness is the theme throughout in the management of the third stage of labor.

Discussion opened by Chester C. Doherty, Chicago.



## 11:10—Icterus of the Newborn”.....

.....Craig D. Butler, Chicago

An attempt is made to correlate the various theories offered to explain the occurrence of icterus neonatorum and icterus gravis. The incidence of icterus in three-thousand newborns observed at Cook County Hospital is reported and discussed in its relation to other factors.

Discussion opened by Carl E. Sibilsky, Peoria.

## 11:40—“Improved Post-Operative Care”....

.....W. C. Bornemeier, Chicago

Comparing post-operative management of abdominal surgery of 1910 with that of 1930 suggested to E. M. Heacock, M. D., F. A. C. S. and the author, that there might still be room for improvement. By the simple method of withholding fluids by mouth for thirty-six to seventy-two hours and giving sizable amounts of morphine, we have reduced post-operative vomiting nearly one hundred per cent., almost eliminated post-operative distention and reduced the average hospital stay from sixteen days to eleven days.

Discussion opened by D. D. Smith, Decatur.

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## WOMEN PHYSICIANS' ACTIVITIES

Programs of special interest have been arranged for the Visiting Women Physicians at the Illinois State Medical Society Meeting.

*Tuesday Morning, May 18, 1937*

9:00—Registration at the Hotel Pere Marquette.  
Breakfast at the Hotel Pere Marquette.  
Business meeting of the Illinois Branch of the National Medical Women's Association.

10:00 The Illinois Branch of the National Medical Women's Association will meet with the Obstetrical section.

*Tuesday Evening, May 18, 1937*

6:30 Twilight drives over the Bluffs and through Grand View Drive.

7:00 Dinner at the Peoria Country Club.

Address by Dr. Mary G. Schroeder, Elgin,  
“Psychiatry as a Specialty for Women Physicians.”

Musical in the lounge following the address.

Dr. Margaret Meloy of Peoria is in charge of local arrangements for the Women Physicians' special meetings.

## CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE &amp; SURGERY

George W. Staben, *President*.....Springfield  
Frederick W. Slobe, *Vice-President*....Chicago  
Frank P. Hammond, *Secretary-Treasurer*....  
.....Chicago

## ANNUAL MEETING, PEORIA

*Tuesday Morning, May 18, 1937*

James H. Finch, *Program Chairman*.....  
.....Champaign

Arthur H. Conley, *Co-Chairman*.....Chicago  
9:00 to 12:30

“Treatment of Wounds”.....  
.....Darwin Kirby, Champaign

“Injuries to the Intervertebral Disc—Roentgen Study”.....Harry A. Olin, Chicago

“The Economic Aspect of Abdominal Drainage”.....J. B. Moore, Benton

“Malpractice in Relation to Industrial Surgery”.....Mr. Edward W. Rawlins, Chicago  
Arthur H. Conley, Chicago. Discussion.

“Medical Problems of the Industrial Commission”.....Philip H. Kreuscher, Chicago

*Tuesday Afternoon, May 18, 1937*

2:30 to 5:00 In conjunction with Surgical Section of the Illinois State Medical Society.

“Pellegrini—Stieda's Disease,” .....  
.....Ralph M. Carter, Green Bay, Wis.

“Operation—Neck of the Femur.” Movie Demonstration.....James J. Callahan, Chicago

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## ILLINOIS STATE MEDICAL SOCIETY

## EIGHTY-SEVENTH ANNUAL MEETING

PEORIA, ILLINOIS

*May 18, 19, 20, 1937*

## WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

## OFFICERS

President, Mrs. F. P. Hammond.....Chicago  
President-Elect, Mrs. H. B. Henkel..Springfield  
First Vice-President, Mrs. E. J. Berkheiser..

.....Chicago  
Second Vice-President, Mrs. I. L. Foulon....

.....East St. Louis  
Third Vice-President, Mrs. A. H. Brumback..

.....Chicago  
Treasurer, Mrs. William Raim.....Chicago

Corresponding Secretary, Mrs. Frank Alford..  
.....Crystal Lake

Recording Secretary, Mrs. A. H. Baugher....  
.....Chicago

## COUNCILORS

Mrs. Imas Rice, Aurora, Ill. ....1st Dist.  
Mrs. R. E. Davies, Spring Valley, Ill...2nd Dist.  
Mrs. Lucius Cole, River Forest, Ill....3rd Dist.

Mrs. E. J. Meyer, Chicago, Ill. . . . . 3rd Dist.  
 Mrs. Carl A. Hedberg, Chicago, Ill. . . . 3rd Dist.  
 Mrs. F. E. Bollaert, East Moline, Ill. . . 4th Dist.  
 Mrs. J. E. Reisch, Springfield, Ill. . . . 5th Dist.

6th Dist.  
 Mrs. T. D. Laney, Salem, Ill. . . . . 7th Dist.  
 Mrs. E. F. Allen, Arcola, Ill. . . . . 8th Dist.  
 Mrs. E. W. Burroughs, Harrisburg, Ill. . 9th Dist.  
 Mrs. R. F. Stanton, E. St. Louis, Ill. . 10th Dist.  
 Mrs. E. R. Steen, Joliet, Ill. . . . . 11th Dist.

#### CHAIRMEN OF STANDING COMMITTEES

Organization, Mrs. H. B. Henkel. . . . Springfield  
 Press & Publicity, Mrs. V. M. Seron. . . . Joliet  
 Legislation, Mrs. W. D. Chapman. . . . . Silvis  
 Printing, Mrs. H. M. Camp. . . . . Monmouth  
 Program, Mrs. A. B. Middleton. . . . . Pontiac  
 Revisions, Mrs. R. K. Packard. . . . . Chicago  
 Public Relations, Mrs. J. A. Wolfer. . . . Chicago  
 Hygeia, Mrs. M. L. Hole. . . . . Danville  
 Finance, Mrs. F. O. Frederickson. . . . Chicago  
 Archives, Mrs. John Soukup. . . . . Chicago  
 Hostess, Mrs. A. H. Brumback. . . . . Chicago  
 Credentials & Registration, Mrs. I. L. Foulon  
 . . . . . East St. Louis  
 Convention, Mrs. Milo Easton. . . . . Peoria

#### CHAIRMEN OF ANNUAL MEETING COMMITTEES PEORIA AUXILIARY

Credentials, Registration. . . . . Mrs. J. E. Bellas  
 Mrs. M. G. Bohrod  
 Hospitality . . . . . Mrs. Perry B. Goodwin  
 Mrs. L. A. Burhans  
 Luncheon, Public Relations. . . . .  
 . . . . . Mrs. W. H. Holbrook  
 President's Luncheon. . . . . Mrs. W. A. Hinckle  
 Mrs. E. P. Coleman  
 Bridge Dinner. . . . . Mrs. F. M. F. Meixner  
 Mrs. E. C. Kelly  
 Mrs. A. D. Phillips  
 Mrs. R. A. Hanna  
 Dinner Dance. . . . . Mrs. W. C. Williams  
 Mrs. Robert M. Sutton  
 Mrs. Clifton S. Turner  
 Tea, Country Club. . . . . Mrs. John R. Vonachen  
 Mrs. Harry Durkin  
 Transportation . . . . . Mrs. Wilbur L. Bowen  
 Miss Mary Knapp  
 Hygeia. . . . . Mrs. James A. Walsh  
 Board Breakfast. . . . . Mrs. Fred H. Decker  
 Publicity. . . . . Mrs. C. G. Farnum

#### WOMAN'S AUXILIARY PROGRAM

All physicians' wives are urged and cordially invited to attend all general sessions of the Auxiliary and their luncheons, dinners, tea, and tours.

#### *Tuesday Morning, May 18, 1937*

8:30 Registration at Headquarters, Jefferson Hotel. All business sessions to be held in the Ball Room of the Jefferson Hotel.  
 10:00 Board Meeting.  
 11:30 Conference of County Presidents and members with the President-Elect and the following State Chairmen: Legislation, Hygeia, Public Relations and Organization.  
 12:00 Luncheon—Creve Coeur Club. Mrs. Frank P. Hammond, President of the State Auxiliary, presiding.  
 Address—Mrs. Robert Fitzgerald.

#### *Tuesday Afternoon, May 18, 1937*

2:00 General Session for all physicians' wives, Jefferson Hotel.  
 Invocation.  
 Address of Welcome—Mrs. Milo T. Easton, Convention Chairman.  
 Response—Mrs. Harry J. Dooley.  
 4:00—6:00  
 Tea and Musical—Peoria Country Club.  
 Violinist—Mrs. Harry Lloyd  
 Soloist—Mrs. Gilbert Geiger  
 Accompanist—Mrs. Harry A. Durkin  
 Soloist on Piano—Master Harry A. Durkin.  
 7:00 Dinner Bridge at the Jefferson Hotel.  
 Mrs. F. M. Meixner, Chairman.  
 Mrs. E. C. Kelly  
 Mrs. R. A. Hanna  
 Mrs. A. D. Phillips

#### *Wednesday, May 19, 1937*

8:00 Breakfast for Board Members only. Jefferson Hotel.  
 9:30 Business Session. Jefferson Hotel.

#### *Wednesday Afternoon, May 19, 1937*

1:00 President's Luncheon, Jefferson Hotel.  
 Guests of honor—All Past-Presidents.  
 Introduction of the incoming President, Mrs. H. B. Henkel.  
 Also of Councilors, the newly elected officers, of the Woman's Auxiliary to the Illinois State Medical Society.  
 Address by Frank J. Jirka, Director,



Illinois Department of Public Health.

- 3:30 Tour and trip through the Hiram Walker Distillery.

*Wednesday Evening, May 19, 1937*

- 6:30 President's Dinner and Dance—Ball room of the Pere Marquette Hotel.  
Before 3:00 P. M. all visitors must be registered for the trip to the Country Club and Hiram Walker Distillery. Cars leave the Liberty Street side of the Jefferson Hotel promptly at 3:30 each day. Please register at the INFORMATION DESK either at the Jefferson or the Pere Marquette Hotels.  
Peoria's hostesses will be found in the lobby of both hotels.

*Thursday Morning, May 20, 1937*

- 8:00 Board Breakfast—Guests of Mrs. F. P. Hammond, President of the Auxiliary.  
9:30 Post Convention Board Meeting—Mrs. H. B. Henkel presiding. Jefferson Hotel.

#### SOCIAL FUNCTIONS FOR ALL LADIES

*Tuesday, May 18, 1937*

- 12:00 Noon Luncheon—Creve Coeur Club.  
4:00 to 6:00 Tea and Musical at the Peoria Country Club.  
7:00 Bridge Dinner at the Jefferson Hotel.

*Wednesday, May 19, 1937*

- 1:00 Luncheon at the Jefferson Hotel.  
4:00 Trip through Hiram Walker Distillery.  
6:30 President's Dinner and Dance. Cards. Pere Marquette Hotel.

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#### SECTION PROGRAMS

##### SECTION ON MEDICINE

James G. Carr.....Chairman  
Cecil Jack .....Secretary

*Tuesday Afternoon, May 18, 1937*

Hotel Pere Marquette Ball Room

- 2:30—"Heart Disease Complicated by Pregnancy".....  
Gertrude M. Engbring, Don C. Sutton, Chicago  
A study of 1400 women who have been referred to the Heart Clinic from the Prenatal Clinic because of some cardiac abnormality.

The diagnosis of heart disease during pregnancy is discussed.

The course of heart disease during pregnancy, labor and the postnatal periods have been studied, often several times in the same patient.

A comparison is made of the prognosis of women who have borne children with those who have not,

The care of the cardiac patient during pregnancy and labor is discussed.

Discussion opened by James E. Fitzgerald, Chicago.

- 3:00—"Whole Suprarenal Gland—A Useful Therapeutic Agent" (Lantern Slides)....

.....Orville Barbour, Peoria

A report of seven years experience with the oral administration of whole suprarenal gland in certain clinical disorders of infants and children. Several hundred cases were studied. The results disprove the prevalent impression that this glandular substance is ineffective when given by mouth. Its effects upon various disorders are described according to their anatomical origin. The results obtained depend upon the potency of the products used. Contraindications and untoward reactions are pointed out.

Discussion opened by James W. Sours and James T. Jenkins, Peoria.

- 3:30—"Clinical Problems in Diabetes".....

.....Robert W. Keeton, Chicago

The purpose of the discussion is to consider the management of some clinical problems presented by diabetics.

1. The layman hopes for a cure for diabetes. Until he is educated he is not content to accept a plan which promises only control.

2. The primary object of diet planning is to secure a diet, adequate in all respects, adapted to the patient's needs, and easily procurable. It should not differ materially from one eaten by his associates.

3. All diabetics even though they have only mild cases should be so trained that the institution of insulin is possible at any time.

4. Many cases show polyneuritis; diarrhea, irritable bowel; urinary fecal incontinence and painful extremities. Their management is discussed.

Discussion opened by George W. Parker, Peoria.

- 4:00—"Metaphen Intravenously in the Treatment of Tularemia".....

.....F. L. Barthelme, Effingham

Discussion opened by Samuel E. Munson, Springfield.

- 4:30—"Dangers of Rapid Diuresis in the Cardio-Renal Vascular Patient".....

.....M. Herbert Barker, Chicago

Patients with long standing severe congestive heart failure have variable degrees of reduced renal function. Modern methods of careful ionic diets, remineralization and mercurial diuretics result in a rapid diuresis in most instances. The clearing of waste products such as urea, phosphates and other acids lag behind the clearance of water. This results in their great concentration causing a severe acidosis, uremia and death. The need for caution and frequent changes of the dietetic and therapeutic control of this type of patient is to be discussed.

Discussion opened by Harry A. Durkin, Peoria.

*Wednesday Morning, May 19, 1937*

Ball Room

Joint Session with Sections on Surgery and Radiology

Symposium on Appendicitis

1. "Surgical Treatment of Appendicitis in Children".....Edwin M. Miller and  
.....Edgar Turner, Chicago

A careful clinical study of five hundred cases of acute appendicitis at the Children's Ward of the Cook County Hospital during the past three years warrants the following conclusions as to the methods of treatment:

In all cases of acute appendicitis before the stage of perforation, immediate appendectomy is indicated. Those cases consulting the surgeon a week or ten days after the onset of perforation at a time when a localized inflammatory mass can be felt on examination, had best be treated conservatively. It is only the exceptional case in this group that will need surgical drainage. All cases presenting evidence of spreading peritonitis without clinical manifestations of localization had best be given the benefit of appendectomy no matter what the duration of time since the perforation occurred.

2. "Difficulties in Diagnosis of Appendicitis"  
.....Darwin Kirby, Champaign

The difficulty in profiting from the mistakes of others. The role of villain which the urinary tract presents in diagnosis. Confusing picture often presented by pelvic infection. Importance of referred pain. White blood counts and differential with special reference to Shilling count as aid in difficult decisions. Importance of history, especially time element. Illustrative cases and cross section of surgical opinion from recent literature.

3. "The Radiological Appendix".....  
George M. Landau, Robert A. Arens, Chicago

The appendix, from the radiological viewpoint, will be considered. The radiological examination is often of extreme help in the determination and accurate localization of pain points to the appendix, regardless of position, which may vary considerably, having been found deep in the pelvis, in the midline, and up to the upper right quadrant in the gall bladder area. Roentgenoscopy permits of accurate localization and association of the appendix with pain points. Terminal ileitis can also be easily differentiated. The size, shape, location and variations will be considered.

4. "Diagnosis of Appendicitis in Children"  
.....H. W. Elghammer, Chicago

Abdominal pains and gastro intestinal upsets are extremely common during childhood.

Acute appendicitis presents one of the most difficult problems, we encounter among children.

The history of onset and the sequence of symptoms are of great importance.

The approach and technic of physical examination requires special consideration.

Positive and negative findings; associated pathology and differential diagnosis.

5. "Diagnostic Difficulties in Appendicitis"  
.....LeRoy H. Sloan, Chicago

The five cardinal symptoms of typical acute appendicitis, the progress of these typical signs and symptoms, and the two absolute essentials in diagnosis of acute appendicitis, variations in the progress of difficulties in diagnosis and differential diagnosis, certain specific diagnostic difficulties in connection with more obscure diseases are discussed. Also there is some discussion of surgical complications for which the internist is called.

6. "Post-Operative Complications of Acute Appendicitis and Their Treatment".....  
.....Ciney Rich, Decatur

The postoperative complications of acute appendicitis and their subsequent treatment, depends to a large extent upon the stage of the disease with which one is dealing. Thus complications are most rare when the operation has been performed in the first thirty-six or forty-eight hours. They are more numerous and grave during the intermediate period extending from the second to the sixth day. Cases living to come to later operation, usually have developed immunological response and some localization of their peritoneal infection.

The commoner complications to be discussed are: peritonitis (local and generalized), ileus, secondary abscess, chest complications, phlebitis, pyemia, fecal fistula, intestinal obstruction, adhesions, and ventral hernia.

The treatment of these complications is usually surgical, and the earlier treatment is instituted following diagnosis, the better are the patient's chances for recovery.

*Wednesday Afternoon, May 19, 1937*

Ball Room

- 2:30—Chairman's Address — "Prognosis in Cardiac Disease"....James G. Carr, Evanston
- 2:50—"Scarlet Fever and Its Complications"  
.....Eberhardt H. Quandt, Rockford

In a statistical study of 783 school children, one year after having had scarlet fever, the order of frequency of acute complications was determined as well as the presence of chronic lesions in the middle ear, heart, the central nervous system, etc. Twenty-four per cent of all cases were found to have developed one or more complications of which otitis media was the most frequent. It was of interest, for example, to find that 65 per cent of the middle ear complications occurred between the ages of 6 to 10. In this relatively severe epidemic the incidence of scarlet fever for the total school population was 5.2 per cent with the lowest incidence in the school with the highest percentage of immune children prior to the epidemic.



Discussion opened by Scott J. Wilkinson, Decatur.

### 3:10—"Malaria with Special Reference to Narcotism" .....

Italo F. Volini, William W. Shapiro, Chicago

This study includes one hundred fifteen malaria patients. Sixty per cent were men.

Narcotic addiction, especially to heroin, is present in thirty-three per cent. It is most frequent in young men, especially of the colored race. The presence of malaria in the colored in Chicago is strongly suggestive of narcotism.

The parasites chiefly responsible for malaria were the tertian and aestivo-autumnal; the latter is foreign to the Chicago region, is usually seen in drug addicts, and produces a malaria having a great morbidity.

A suggestion is offered to explain the rising incidence of malaria in narcotic addicts.

Discussion opened by Edward J. Wheatley, Danville.

### 3:30—"Myxedema Heart" .....

.....V. Thomas Austin, Urbana

The syndrome of "Myxedema Heart" is discussed with special reference to the infrequency of associated congestive failure. Controversy over this feature may be based on lack of uniformity of acceptance of criteria of congestive failure as compared to manifestations of myxedema per se. A case of severe myxedema is presented in which marked enlargement of the heart with typical electrocardiographic changes returned to normal under thyroid medication. The association of paroxysmal tachycardia and auricular fibrillation with vascular collapse prior to treatment without evident coronary changes or other organic heart disease, presents a possible unusual complication of "Myxedema Heart."

Discussion opened by Frank Deneen, Bloomington.

### 3:50—"The Treatment of Hypogenitalism in the Male".....W. O. Thompson,

N. J. Heckel, P. K. Thompson, Chicago

In the course of treating a large number of boys and men for undescended testes and hypogenitalism with an anteriorpituitary-like principle, the following facts were demonstrated:

1. Descent of the testes was produced in only 20 per cent.
2. Treatment with this material produced an increase in the size of the parts involved.
3. In some boys the increase in the size of the genitalia was very marked, so that a premature puberty was induced. This is one of the most serious problems involved in the treatment.
4. The increase in size was variable, dependent upon the age.

Discussion opened by Frank A. Norris, Jacksonville.

### 4:10—"Pulmonary Changes in Rheumatic Fever" .....

Perry P. Melnick, Decatur

In acute rheumatic fever the lungs at autopsy have a characteristic gross appearance, often called "rheumatic pneumonitis." A histologic study of the lungs was made in ten cases of rheumatic endocarditis with only verrucous eruptions and no valvular deformities. The microscopic findings consists essentially of an intense interstitial edema and hyperemia, more intense than can be explained on the basis of passive congestion alone. While not a specific pneumonia, the lung changes in rheumatic fever may be part of the allergic picture seen in this disease.

Discussion opened by Leon Unger, Chicago.

*Thursday Morning, May 20, 1937*

Ball Room

Joint Session with Sections on Surgery; Eye, Ear, Nose and Throat; Public Health and Hygiene; and Radiology

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### SYMPOSIUM ON ACUTE INFECTIOUS DISEASES

#### 9:00—"Infections of the Upper Lip".....

.....Norman Elliott, Bloomington

This paper is to review the anatomy of the upper lip and the reason for the severity of infections of the upper lip.

Also a plea for increased interest in the profession to acquaint the laity with the dangers of any manipulation of any infection of the upper lip, no matter how slight.

Also to stress the conservative treatment of infections of the upper lip in the early stages.

#### 9:15—"Acute Infections About the Jaws"...

.....F. W. Merrifield, Chicago

Acute infections about the jaws are common sequelae to inflammation of peridental tissues, which extends to the adjacent periosteum and soft tissues.

The chief causal factor in these conditions is death and infection of the tooth pulp, either as a result of neglected dental caries or trauma.

As a general rule, acute alveolar—dental abscess, will respond to the usual dental treatment. However, as a result of trauma, particularly from ill-advised extraction, a severe infection with involvement of the soft tissues and bone may end disastrously, if not fatally, to the patient.

Because of the serious nature of these infections it seems advisable to treat even the simplest inflammation of dental origin with respect.

To present observations on these cases will be the object of this paper.

#### 9:30—"The Fundamentals of Serum Therapy".....Winston H. Tucker, Springfield

A review is presented of the disease conditions in which serum therapy has been found to be of value. The various types of animal sera and human convalescents' sera are considered, with a discussion of time and routes of administration of each. The value of serum for prophylactic use in certain conditions is touched upon. When serum of any sort is employed,

the physician must be certain that the patient has not been previously sensitized to serum protein, in order to eliminate untoward reactions. This can be determined by a simple skin test, which may be followed by desensitization when such a procedure is indicated.

Discussion opened by George L. Drennan, Jacksonville.

9:45—"Human Convalescent Serum Treatment in Surgical Infections Due to Streptococcus Hemolyticus".....

.....Samuel L. Goldberg, Chicago

Pooled scarlet fever convalescent serum has been used in acute surgical infections due to the hemolytic streptococcus. This is a presentation of case reports of these infections treated with convalescent serum, and a discussion of the practical and theoretical considerations governing this form of therapy.

10:00—"The Quantitative Aspects of Biologic Therapy".....

.....Paul S. Rhoads, Evanston

Unless one constantly bears in mind the quantitative nature of immunity he is apt to make mistakes in biologic therapy. Examples of such mistakes will be cited. Data collected from the literature on more than 2,000 cases of tetanus developing after the administration of tetanus antitoxin will be cited. The quantitative aspects of the various preparations used in active and passive immunization against scarlet fever and diphtheria will be discussed. Brief mention of pertussis prophylaxis and specific therapy of lobar pneumonia will be made.

10:15—"Type-specific Antipneumococcus Serum Therapy".....

.....W. D. Sutcliff, Chicago

The therapeutic tests with type-specific antipneumococcus serum have been conducted in a more careful and thorough manner than has been the case with any previous therapeutic serum. Data will be presented today that give an adequate description of the effect of therapy on the clinical course and the mortality of the disease in America, in England, in hospitals, and in private practice in the home. Intravenous administration of adequate amounts of potent preparations of pneumococcus antibody solutions to patients in the early days of the infection will be shown to be the secret of success. Means of avoiding the dangers inherent in intravenous administration will be described. Comparisons will be made which show that the results of the efficient administration of type-specific antipneumococcic serum are comparable to those following the efficient administration of diphtheria antitoxin. Progress is constantly being made, and it now appears likely that type-specific therapy will be used as advantageously in pneumonia due to types II, 5, 7, and 8, as it can be used in pneumonias due to type I pneumococci.

10:30—"Human Convalescent Serum and Its Application to Acute Infectious Diseases".....

.....Sidney O. Levinson, Elizabeth

Penruddocke, A. B., Albert M. Wolf, Chicago

Human convalescent serum has been prepared at the Serum Center and the results of its use followed for over six years. Certain principles must be maintained

in the technique of preparing human convalescent serum to insure a safe and effective product.

Splendid cooperation by many physicians reporting results on the use of serum and personal observation of many patients have been the means of establishing criteria of dosages and route of administration. Human convalescent serums have been employed extensively and effectively in the treatment of poliomyelitis, the prophylaxis and treatment of scarlet fever and in the prophylaxis of measles. Limited observations have been made of the application of human convalescent serum in other acute infectious diseases. The results have been analyzed and tabulated.

10:45—"Roentgen Therapy in Inflammatory and Infectious Lesions".....

.....B. C. Cushway, R. J. Maier, Chicago

This presentation includes a discussion of the theories of the biological action of x-rays in inflammation and infection; dosage correlated with the accepted theories; and a report of a series of all types of infection and inflammation treated by roentgen rays.

11:00—"The Control of Rabies".....

.....Maurice L. Blatt, Chicago

Spot maps will be presented showing the location by counties of positive dog heads, of dog bites and of human rabies in the state of Illinois for 1936. An outline of the method advocated for the elimination of rabies will be presented. An outline of the treatment of dog bites will be shown on slides. A hundred feet of 16 mm. movie of a child with violent rabies will be shown.

Discussion opened by Maurice Schneider, Chicago.

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## SECTION ON SURGERY

C. Paul White.....*Chairman*

Sumner Koch.....*Secretary*

*Tuesday Afternoon, May 18, 1937*

Early American Room

TREATMENT OF INJURIES

2:30—"The Immediate Treatment of Injuries of the Spinal Cord"....

Loyal Davis, Chicago

Injuries to the spinal column in which the spinal cord escapes damage present a quite different problem and permit simpler therapeutic measures to be used than those in which the cord and nerve roots are involved. Prompt recognition of the problem with rational and conservative methods of treatment can accomplish much under the latter circumstances.

The mechanism and nature of fracture dislocations of the spinal column; the relative size of the spinal cord; the vertebral canal; and the buffer role of the cerebrospinal fluid are important basic factors. The immediate clinical signs of spinal cord injury with practical and simple methods for diagnosing the level of the injury and the value of spinal manometric examinations are discussed. The importance of immediate first aid treatment and the indications for and against operative intervention are emphasized.



2:50—"The Immediate Treatment of Compound Injuries". . . Michael L. Mason, Chicago

In the management of the open wound, every effort should be made to promote healing and functional recovery. Chemical and mechanical damage must be avoided since they retard repair and favor infection. The wound, seen within four to six hours, should be carefully cleansed with soap and water, devitalized tissues excised, deep structures repaired, and the skin defect closed by primary suture or skin graft. Following this, the part should be put at rest until healing has taken place.

3:10—"Operative Treatment of Fractures of the Neck of the Femur." Moving Picture Demonstration. . . . J. J. Callahan, Oak Park

The essayist will show an instrument by which a flange may be used to correct fractured necks of the femur in an accurate and relatively simple manner. He will also demonstrate a new incision which is practically bloodless and yet affords an excellent view of the injury to the femoral neck.

The types of fractures occurring in the femoral neck will be discussed, as well as perforations of the capsule by either the proximal or the distal fragment in such a manner as to prevent reduction of the fracture. He will also describe a definite interposition of the periosteum and synovia between the fragments of femoral neck fractures.

3:30—"Electrical Shock Burns and Glare Injuries of the Eyes" . . . Hart E. Fisher, Chicago

The subject to be given is for the purpose of dispelling the misinformation that the public has received relative to the hazards of electric current, the remote effects of electrification of persons, that being electrified by high tension currents resuscitation is futile, confusion regarding scientific burn therapy and eye conditions resulting from glare of electric flashes.

The prevention treatment has proven most successful in the author's twenty-five years experience in this field.

General Discussion.

3:50—(Title will be announced later) . . . . .

. . . . Ralph M. Carter, Green Bay, Wisconsin

4:10—"Growth Deformities Resulting from Osteomyelitis" . . . . John A. Siegling, Chicago

Skeletal deformities in osteomyelitis due to disturbances of epiphyseal cartilage growth are more frequent than is commonly considered to be the case. Total arrest of growth from an epiphyseal cartilage may result in angular deformity of the extremity. The amount of shortening or deformity depends upon the rate of growth of the epiphyseal cartilage involved and upon the age of the child at the time of growth arrest. The destruction of epiphyseal cartilage disc may be due to direct extension of pyogenic infection into it, to interference with blood supply of adjacent bone, or occasionally to trauma of inadvisable or too extensive surgical procedures. Overgrowth of the lone bone due to

the presence of a chronic low grade infection in the juxtaepiphyseal region occasionally occurs but does not commonly produce a marked length inequality or deformity. Early recognition of the presence of arrested growth and prevention of deformity are stressed. Correction of deformities and length inequalities resulting from osteomyelitis are discussed.

*Wednesday Morning, May 19, 1937*

BALL ROOM

Joint Session with Sections on Medicine, and Radiology

SYMPOSIUM ON APPENDICITIS

1. "Surgical Treatment of Appendicitis in Children" . . . . .  
Edwin M. Miller and Edgar Turner, Chicago
2. "Difficulties in Diagnosis of Appendicitis"  
. . . . . Darwin Kirby, Champaign
3. "The Radiological Appendix" . . . . .  
George M. Landau and Robert A. Arens, Chicago.
4. "Diagnosis of Appendicitis in Children"  
. . . . . H. W. Elghammer, Chicago
5. "Diagnostic Difficulties in Appendicitis"  
. . . . . LeRoy H. Sloan, Chicago
6. "Post-Operative Complications of Acute Appendicitis and Their Treatment" . . . . .  
. . . . . Cliney Rich, Decatur  
(For abstracts of papers, see Section on Medicine.)

*Wednesday Afternoon, May 19, 1937*

Early American Room

2:30—"Bile Peritonitis with Case Report" . . .

. . . . . R. E. L. Gunning, Galesburg

About forty-five cases of bile peritonitis without perforation of the gall bladder, ducts, or liver have been reported in the literature. The first case has been reported by Clairmont and Von Haberer in 1910; the most recent by L. B. Johnston in 1936. Most of the cases reported have presented a clinical picture of appendicitis and have been operated as such. Idiopathic bile peritonitis presents certain physiological changes unlike other forms of peritonitis. Permeability of the walls of the arterioles and venules due to the action of bile resulting in a diffusion of plasma from the circulation into the peritoneum is the basis for the clinical findings. E. Andrews, University of Chicago, 1936. Accompanying this condition of excessive collection of bile fluid in the abdomen is a condition of surgical shock due to shunting of the plasma from the peripheral circulation into the peritoneum. Analysis of all cases of bile peritonitis, particularly those reported by S. H. Mentzer, San Francisco, California 1934, indicates surgical drainage as the ideal treatment for such a condition. In all cases where drainage has been established and fluid balance instituted to replace the loss of blood plasma, recovery has been effected. The tendency to deviate from the older principle of

drainage for all abdominal conditions should not be adhered to in these cases of the bile peritonitis. Prompt, effective drainage is indicated.

2:50—"The Correction of Deformities by the Equalization of Leg Length." Methods and Results . . . . . Paul H. Harmon, Chicago

The conditions which lead to unequal leg length are enumerated. The mechanism underlying the result and decrease in leg length is suggested in each case.

There are three methods which can be used to equalize the lengths of legs. One, epiphyseo-diaphyseal fusion in the sound extremity can be applied only during the period of rapid pre-adolescent growth, i. e., roughly 9 to 14 years. This method must be applied in relation to the expected amount of longitudinal growth in the diseased limb as well as upon racial and family expectancy. One or more epiphyses can be closed depending upon the amount of equalization to be obtained. The other two methods: lengthening the short diseased leg by excision of a portion of the diaphysis or shortening the long well leg can be accomplished at any period but preferably should be done after adolescence so that an estimation can be made of the total amount of desired permanent alteration.

3:10—"The Surgical Pathology of Tumors of the Breast" . . . . . R. B. Malcolm, Chicago

The discussion of tumors of the breast in this paper will be based upon some 200 such tumors which have been observed and diagnosed pathologically at the Research Hospital. The prevalent type is fibro-adenoma, composing approximately 60%, the remaining 40% are carcinomata showing every variety. The major portion of the time will be consumed by the discussion of the pathological entities of carcinoma showing histological slides and the methods of spread of the disease.

3:30—"X-Ray Therapy in Cancer of the Breast" . . . . . James T. Case, Chicago

A brief story of the development of radiation therapy of the breast to its present refinement.

Application of the Coutard principle to radiation therapy of breast cancer.

Summary of technic and results.

Critique of reports in the literature.

3:50—"A General Consideration of the Treatment of Cancer of the Breast" . . . . .

. . . . . Alexander Brunschwig, Chicago

A number of years ago it appeared to be generally accepted that the radical operation was the treatment of choice for carcinoma of the breast. In recent years great advances have been made in irradiation therapy. Its employment has been considerably extended in the treatment of various forms of cancer, including operable cancer of the breast.

A few surgeons now appear to be more conservative in the operative treatment of carcinoma of the breast, feeling presumably that adequate post-operative irradiation is capable of affording the patient as good a chance for cure as offered by the radical operation. In the essayists opinion this view is unjustified. Radical mas-

tectomy with removal of the axillary contents, pectoral muscles and breast, en masse, should still be regarded as the best method, by far, for the treatment of operable cancer of the breast. Points of operative technique and the limitations of irradiation therapy in cancer of the breast will be discussed.

*Thursday Morning, May 20, 1937*

BALLROOM

Joint Session with Sections on Medicine; Eye, Ear, Nose and Throat; Public Health and Hygiene; and Radiology

(For program, see Medical Section.)

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SECTION ON EYE, EAR, NOSE AND THROAT

John A. Cavanaugh . . . . . *Chairman*

Charles B. Voigt . . . . . *Secretary*

*Tuesday Morning, May 18, 1937*

CREVE COEUR ROOM

9:30—"Stabilization of the Temporomandibular Joint" . . . . . L. W. Schultz, Chicago

Various treatments for uncomfortable, weak, dislocating, loose, clicking, grating joints have been tried and found wanting. The stabilization of such joints is no longer problematical. A simple method now stops the symptoms of an aggravating traumatic arthritis of this type.

10:00—"The Oculist and Refraction" . . . . .

. . . . . Edwin R. Lescher, Chicago

This problem of the gradual taking over of our tonsillectomies and throat work by the general man and the danger of losing our refraction business to the optometrist, optician, and department stores, and a plea to the Eye, Ear, Nose and Throat man to put his refraction equipment and methods on a par with them. A discussion on retinoscopy without cyclopegia, practical because of the united optometric propaganda against the use of "drops."

Discussion opened by W. F. Lamkin, Champaign.

10:30—"Bronchoscopy in Bronchial Asthma"

. . . . . Albert H. Andrews, Jr., Chicago

The development of the role of bronchoscopy is a most interesting subject as it unfolds in the literature. We first find bronchoscopy used in an occasional case by brave clinicians, then used in patients who did not respond to the usual methods of therapy, and today we find descriptions of the types of bronchial asthma which will respond well to bronchoscopic therapy. This subject is intensely practical for it gives a method of effective treatment to a frequently refractive type of asthma, as well as making diagnosis more accurate and supplying the allergist with better vaccines.

The bronchoscopic examination is made for three purposes:

1. Diagnosis.
2. Collection of secretion for vaccine.
3. Therapeutic effect.



The mechanism of relief by bronchoscopy and the indications for therapeutic bronchoscopy in relation to other therapeutic measures are discussed. Over two hundred cases from the literature are analyzed statistically and the summaries presented. A classification of bronchial asthma according to the bronchial pathology and its practical application is presented.

Discussion opened by Leon Unger, Chicago; H. R. Watkins, Bloomington; and Paul H. Holinger, Chicago.

11:00—"Lessons Learned from Blind School Survey". Robert J. Masters, Asst. Professor, Ophthalmology, Univ. of Indiana, Indianapolis

Three years ago it was discovered that the Indiana State School for the Blind had very inadequate records of the causes of blindness of its students. A survey was therefore undertaken with the purpose of making a record, as accurate as possible, of the cause of blindness of each student. During the course of this survey several interesting discoveries were made, as follows:

1. Practically every application for admission to the school carries upon it a "cause of blindness" which is meaningless and utterly useless for the compilation of statistics.

2. Considerable difficulty is encountered in making an accurate diagnosis by examination in many cases, because of lack of dependable history, plus inability to satisfactorily examine the eye grounds.

3. A challenge to the medical profession is offered by the relatively large number of children whose blindness could have been prevented.

4. The large number of cases of inherited blindness, with the apparent high percentage of transmission of some types of inherited blindness, offers another challenge to the medical profession. Some methods of meeting this problem will be discussed.

5. There are always a number of students at the school who should not be there. The need for a larger number of more widely distributed sight conservation classes is apparent.

6. The possible advantages to be derived by a school for the blind from a trained social service worker will be discussed.

7. There is no doubt regarding the value of group studies such as this for the statistical files of the National Society for the Prevention of Blindness. Similarly each individual ophthalmologist could render invaluable service to this organization by reporting to it all of the new cases of blindness which occur in his own practice every year.

11:30—"Ill Advised Nasal Surgery".....  
.....H. L. Ford, Champaign  
A plea for more thorough pre-operative study.

Discussion opened by George Woodruff, Joliet.

*Tuesday Afternoon, May 18, 1937*

CREVE COEUR ROOM

2:30-5:00—"Round Table Discussion"  
(Ophthalmology).....E. K. Findlay,

Discussion of the practical points in operation for cataract—including preparation of patient, complications and after treatment.

Philip Corboy, Alva Sowers, and E. F. Snyder, Chicago.

E. F. Snyder, Chicago.

2:30-5:00—(Subject to be announced)

Thomas Allen, Chicago.

2:30—"Round Table Discussion" (Ear, Nose, Throat).....Joe Beck, Chicago, Director

Harry L. Pollock, Chicago, Associate Director  
Group 1

Management of Cases of:

1. Acute Middle Ear and Mastoid Disease in Infants and Children.

S. Livingston, Chicago.....(20 minutes)

Alfred Lewy, Chicago. Discussion....

.....(10 minutes)

2. Acute Infections of Pharynx and Larynx.

Walter Stevenson, Quincy... (20 minutes)

Frank Novak, Chicago. Discussion....

.....(10 minutes)

3. Chronic Sinus Infection in Children and Adults.

J. R. Lindsay, Chicago.....(20 minutes)

G. H. Scott, Chicago. Discussion.....

.....(10 minutes)

4. REST PERIOD.....(5 minutes)

5. Discussion (General).....(15 minutes)

6. Discussion (Closing).....(10 minutes)

Group 2

1. Acute Sinus Infection in:

(a) Children.

(b) Adults.

H. L. Ford, Champaign.....(20 minutes)

S. Morwitz, Chicago. Discussion.....

.....(10 minutes)

2. Reconstruction Operations About the Face for the Otolaryngologist.

M. Reese Guttman, Chicago.(20 minutes)

Meredith Ostrom, Rock Island. Discus-

sion .....(10 minutes)

3. Carcinoma of Antrum and Naso-Pharynx.

Sam Pearlman, Chicago.....(20 minutes)

Samuel Salinger, Chicago. Discussion...

.....(10 minutes)

4. REST PERIOD .....( 5 minutes)

5. Discussion (General).....(15 minutes)

6. Discussion (Closing).....(10 minutes)

*Wednesday Morning, May 19, 1937*

## CREVE COEUR ROOM

9:00—"A Report on Two Hundred Cataract Operations". . . . . Watson W. Gailey, Bloomington  
This is an analysis of the complications encountered in two hundred cataract extractions in private practice. The four methods employed were:

1. Intracapsular technic using Kalt forceps.
2. Barraquer-employing the erisophake.
3. Smith Intracapsular method.
4. Extracapsular.

No serious attempt will be made to compare the incidence of complications or the end results in this series as the great majority of them were attempts to extract the lens in its capsule with Kalt forceps.

Discussion opened by O. B. Nugent, Chicago; Samuel J. Meyer, Chicago; A. B. Middleton, Pontiac; R. Griffy, Robinson.

9:30—"Modern Conception of Therapy in the Acute Infections of the Nose and Sinuses"

.....O. E. Van Alyea, Chicago

Modern writers on treatment of acute sinusitis lean toward conservatism. Rhinology now has considerable regard for the restoration of normal physiologic function in the treatment of the acute process. During the past decade considerable research in various medical centers throughout the country and abroad has directed attention to the ciliated cells of the nasal and sinus mucosa and we know that our principal means of cleansing the nose and maintaining nasal function depends upon ciliary activity. All drugs and combinations of drugs commonly used in the nose are being carefully studied and those which inhibit ciliary action are being eliminated.

Irrigation of the sinuses is advocated for the removal of pus and the restoration of natural pathways of drainage.

The presentation will include a lantern slide demonstration of the Anatomy of the frontal and maxillary sinuses and their intranasal connections. The technique for irrigating these cavities through their natural openings will be described.

Discussion opened by Francis L. Lederer, Chicago.

10:00—"Report on Periodic Examination of School Children".....

.....G. Harmon Brunner, Glencoe

Discussion opened by Dwight C. Orcutt, Chicago; R. J. Coultas, Mattoon; Douglas A. Lehman, Harrisburg.

10:30—Chairman's Address.....

.....John A. Cavanaugh, Chicago  
Election of officers.

*Wednesday Afternoon, May 19, 1937*

## CREVE COEUR ROOM

2:30—"Borderline Compensable Eye Condi-

tions".....Sidney Walker, Chicago  
St. Luke's Hospital

Injury—claimed as causative factor,  
Refractive errors.  
Hyper. Astig. Myopia,  
Diplopia,

Both paralytic and convergent squint.

Pterygium and Pinguecula,  
Keratitis both superficial and deep,  
Cataract in nearly all forms,  
Iritis

Hyalitis

Retinal condition, most often detachment.

Optic Atrophy.

Claims of aggravation of pre-existing condition, most often found in,  
Cataract,  
Retinal detachment.

Valid trivial eye injuries aggravated by,

Focal infection and systemic infection, superficial lacerations and superficial foreign bodies resulting disastrously.

Safeguards and counter action.

Careful ocular examination very early in eye injury or alleged eye injury no matter how trivial.

Lack of response to local treatment should call for thorough physical examination.

Proper set up from medico-legal standpoint of any case suspected of possible legal controversy.

Present move against ambulance chasing attorneys of aid to defendants.

Discussion opened by C. B. Welton, Peoria.

3:00—"Saddle Nose" .....Samuel Salinger, Chicago, Professor of Otolaryngology, Loyola University, School of Medicine, Attending Otolaryngologist, Michael Reese Hospital

The text will include the treatment of saddle nose with particular reference to twelve years experience with the use of ivory implants. In 1931 I reported my first fifty cases. Since that time I have used ivory in over sixty additional cases with about 85% success. The paper will include the proper selection of cases, the preparation of the implants and the technique of their insertion. Will also discuss the type of case in which auricular cartilage is advisable and demonstrate the details of this operation.

Discussion opened by Harry Pollock, Chicago; Walter Stevenson, Quincy; O. E. Fink, Danville.

3:30—"Allergy of the Upper Respiratory Tract and Its Relation to Other Manifestations".....

French K. Hansel, M. D., M. S., St. Louis, Mo. Assistant Professor of Otolaryngology, Washington University Medical School. Barnes Hospital, St. Louis Children's Hospital, Oscar Johnson Institute and McMillan Hospital

Allergy of the nose and paranasal sinuses will be briefly discussed from the standpoint of diagnosis and



treatment. Then the other manifestations, such as asthma, allergic bronchitis, skin allergy, gastrointestinal allergy and allergic headache will be considered in relation to the nasal symptoms.

#### 4:15—"Cellophane in Ophthalmology".....

..... Ralph H. Woods, LaSalle

Standing hospital orders in eye injuries

1. Mine cases.

2. Factory, Ry. and top men.

Conjunctival burns

Cement, lye acid, lime.

Sewing in cellophane to prevent adhesions.

Neisserian infections

Cellophane for protection of well eye.

Vernal catarrh—Folliculitis of Allergic origin.

Cellophane protestant to eyes.

Cellophane for Submucous and other intranasal dressings.

#### 4:30—"Malignancies" .....

..... Thomas Galloway, Chicago

The treatment of cancer of the larynx with special regard to irradiation and surgery.

#### 5:00—"Report of Intraocular Tumors".....

..... M. L. Ostrom, Rock Island

Title—Three interesting tumors of Uveal Tract

1. Malignant melanoma of iris—Spindle cell appearing 3 years after iridencleisis for glaucoma—Adult white female.

2. Malignant melanoma of choroid—White adult male.

3. Malignant melanoma of choroid mixed cell type II in adult negro male—discovered following enucleation and section of eye.

Discussion of uveal tumors including differential diagnosis.

Discussion of translumination of globe.

Discussion of therapy.

Case histories.

Slides and lantern demonstration.

Discussion opened by M. P. Palmer, Oak Park.

*Thursday Morning, May 20, 1937*

BALL ROOM

Joint Session with Sections on Medicine; Surgery; Public Health and Hygiene; and Radiology

(See Medical Section, for program.)

### SECTION ON PUBLIC HEALTH AND HYGIENE

Archibald Hoyne ..... *Chairman*  
Winston H. Tucker ..... *Secretary*

JEFFERSON HOTEL

*Tuesday Afternoon, May 18, 1937*

2:30—"Control of Smallpox in an Unvaccinated School Population"..... Frank S.

Needham, Commissioner of Health, Oak Park

This paper is a resume of an outbreak of smallpox that developed in a community of 70,000 people, with

a school population of about 13,000 school children, very inadequately vaccinated.

Smallpox had been prevalent in the surrounding towns for several months, contact exposures had been handled apparently successfully, but, eventually, the disease developed in the high school.

Vigorous efforts were put forth, and the outbreak was practically controlled in two weeks.

Discussion opened by I. D. Rawlings, Chicago, Board of Health.

#### 3:00—"Serodiagnostic Tests for Syphilis"..

..... H. J. Shaughnessy

Ph.D., State Health Department, Springfield

A discussion of what recent studies of the serology of syphilis means to the health officer and physician. The principal causes of difficulty in the interpretation of laboratory findings are reviewed. Suggested procedures for the standardization of laboratory tests for syphilis are outlined.

Discussion opened by John L. White, Chicago, Board of Health.

#### 3:30—"Whooping Cough Diagnosis and Prevention" .....

..... L. W. Sauer, Evanston

Whooping cough is most contagious early. Properly exposed cough plates show more colonies of Bordet-Gengou bacilli before the whoop is well established. After that, few if any, are recovered; negative plates do not exclude pertussis. Lymphocytosis gains in diagnostic importance when cough plates are negative. History of exposure in a non-immune child with a suspicious cough has diagnostic value; especially when the disease is prevalent.

The best age for vaccination with potent B. pertussis vaccine is between the seventh and twelfth month of life. (Total dosage, 8 cc. before three years; 10 cc. after three years). Most children so injected acquire immunity, if sufficient time intervenes between injection and exposure. Failures are less frequent since the technic of its commercial preparation has been improved and precautions in vaccine preservation and administration are more fully appreciated.

Discussion opened by Orville E. Barbour, Peoria.

#### 4:00—"Poliomyelitis" .....

..... Archibald L. Hoyne, Chicago

A review of 139 cases cared for in the Municipal Contagious Disease Hospital in Chicago. Discussion concerns the modern conception of this disease, the difficulties encountered in making an early diagnosis, and importance of proper treatment. Isolation and absolute rest are essential during the acute stage. Efficiency of serum treatment is still in doubt. After care is an orthopedic problem.

Discussion opened by John J. McShane, State Health Department, Springfield.

#### 4:30—"Present Problems in Preventive Medicine".....

..... E. A. Thacker,

Health Service, University of Illinois, Urbana

The chronic insidious group of diseases is discussed from a public health viewpoint. The importance of regular physical and laboratory examination and the dangers from self-medication and quackery are stressed.

The medical profession must take the initiative. A program is submitted for the solution of these public health problems. It includes education through radio, newspapers, family physicians, civic organizations, theatres, reputable pharmaceutical firms and insurance companies. The extermination of cults, quacks and "patent medicines" is also a function of the program. By having the support of the people, undesirable forms of socialized medicine can never materialize.

Discussion opened by L. M. T. Stillwell, Health Officer of Urbana.

*Wednesday Afternoon, May 19, 1937*

JEFFERSON HOTEL

2:30—"Industrial Hygiene—Its Historical Development and the Modern Campaign" . . . . . M. H. Kronenberg, Chicago

Health problems in industry are increasing in extent and complexity. Most of them appear as a result of the rapid development and growth of air contaminating industrial processes.

The most important improvements and achievements in this field were due to 1. Legislative acts, 2. Medical inspection of industrial undertakings, 3. Compulsory reporting of industrial diseases and 4. Compensation of the diseased and disabled workers.

The continued success in Industrial Hygiene is only possible through the cooperative efforts of the physician, engineer, statesman and educator.

Discussion opened by George L. Apfelbach, Chicago.

3:00—"Diphtheria Prevention—A Municipal Problem" . . . . . N. C. Bullock, Comr. of Health, Rockford

Diphtheria prevention in Illinois is a problem of the individual city. Some cities in the State have accomplished much in this important public health problem while others have done little or nothing.

The fundamental plans on diphtheria prevention in three cities of the State of Illinois are discussed in brief to represent the three different successful methods of attack. Chicago representing mass immunization under the direction of the Board of Health, Evanston on equal distribution of individual immunization by the family physician and mass immunization, and Rockford representing an example of what may be accomplished in individual immunization done entirely by the family physician in his private office.

Discussion opened by Sumner M. Miller, Health Commissioner of Peoria.

3:30—"Typhoid Carrier Control in Illinois" . . . . . G. Howard Gowen, State Health Department, Springfield

With improvement of water supply, sewage disposal, and more meticulous care of milk, the discovery and

control of the typhoid carrier assumes increasing importance.

It is the purpose of this paper to present the salient features in such control, and the coincident effect on typhoid fever morbidity.

Discussion opened by Roland R. Cross, Dahlgren.

4:00—"Modern Problems in the Control of Streptococcic Diseases" . . . . . John Hays Bailey, Chicago

Isolation and quarantine have failed to control the mortality and morbidity from streptococcic diseases. A short quarantine period may increase the morbidity. The present immunization procedure against scarlet fever does not decrease, apparently, the morbidity from streptococcic infection, although it may lower the scarlet fever rate. The carrier, whether a convalescent or a normal healthy one, must be considered in any control program.

Discussion opened by Arlington Ailes, LaSalle.

4:30—"Problems of a Health Officer in a Town of 40,000 People" . . . . . H. O. Collins, Quincy

A discussion will be presented of the Quincy Public Health District elected by referendum at a general election in 1920 under the Statutes of the State of Illinois. The advantages of operating a Department of Health under this system will be pointed out. An outline will be presented on the procedure to be followed by those communities interested in establishing a Public Health District.

Discussion opened by Warren F. Pearce, Quincy.

*Thursday Morning, May 20, 1937*

HOTEL PERE MARQUETTE BALL ROOM

Joint Session with Sections on Medicine; Surgery; Eye, Ear, Nose and Throat; and Radiology

(See Medical Section for program.)

**SECTION ON RADIOLOGY**

Roswell T. Pettit . . . . . *Chairman*  
Ralph G. Willy . . . . . *Secretary*

*Tuesday Afternoon, May 18, 1937*

VOGUE ROOM

2:30—"Experience with the 'periodicity' method of Ronetgentherapy in the Treatment of Nasopharyngeal Carcinoma" . . . . . Alexander Brunschwig and David Tschetter, University of Chicago

The immediate results in a limited series of cases will be presented.

Discussion opened by Robert F. McNattin, Cook County Hospital, Chicago.



### 3:00—"Radium Therapy of Cancer of Oral Cavity" .....

H. E. Davis, Cook County Hospital, Chicago

Interstitial irradiation by means of either radium or radon, is the method of choice in radium therapy of carcinoma of the lip, tongue, floor of mouth, tonsil and buccal mucosa. Lesions of the palate and alveolar ridge mucosa require contact applications of radium with specially constructed molds. Protracted irradiation with small amounts of radium has produced more complete destruction of the tumor and less destruction of normal tissue than intensive irradiation over a short period of time.

Colored lantern slides will be shown.

Discussion opened by E. G. C. Williams, Danville.

### 3:30—"Some Physical Aspects of Radiation Therapy" .....

....Robert Landauer, Ph.D., Highland Park

The factors involved in obtaining desirable quantity and quality of radiation at a given point in the body are enumerated and discussed in an attempt to enable the radiologist to obtain the greatest efficiency from the apparatus at his command.

Discussion opened by Roy Kegerreis, Chicago.

### 4:00—"Value and Limitation of Encephalography" .....

Abraham Levinson, Chicago

Encephalography is indicated in children who are believed to have organic cerebral lesions, such as birth trauma, cerebral agnesia, chronic encephalitis and some cases of epilepsy. The procedure may furnish not only diagnostic information but prognostic and therapeutic aid. The paper will discuss the technique, untoward symptoms and interpretation of the x-ray film.

Discussion opened by Fred Decker, Peoria.

### 4:30—"Radiographic Visualization of Some Unusual Sinus Tracts" Julius Brams, Chicago

A brief general discussion of the various indications for fistulography, the use of various opaques, the value of radiological exploration of the fistulous tracts, and a report of some unusual cases.

Discussion opened by Perry Goodwin, Peoria.

*Wednesday Morning, May 19, 1937*

BALL ROOM

## SYMPOSIUM ON APPENDICITIS

### JOINT SESSION WITH SECTIONS ON MEDICINE AND SURGERY

#### 1.—"Surgical Treatment of Appendicitis in Children" .....

Edwin M. Miller and Edgar Turner, Chicago

#### 2.—"Difficulties in Diagnosis of Appendicitis" .....

....Darwin Kirby, Champaign

#### 3.—"The Radiological Appendix" .....

George M. Landau and Robert A. Arens, Chicago

#### 4.—"Diagnosis of Appendicitis in Children" .....

.....H. W. Elghammer, Chicago

#### 5.—"Diagnostic Difficulties in Appendicitis" .....

.....Leroy H. Sloan, Chicago

#### 6.—"Post-Operative Complications of Acute Appendicitis and Their Treatment" .....

.....Ciney Rich, Decatur

(For abstracts of papers, see Section on Medicine.)

*Wednesday Afternoon, May 19, 1937*

VOGUE ROOM

#### 2:30—"Silicosis" .....

Roswell T. Pettit,

Character of tuberculous densities can be identified on the Roentgen films as a productive or exudative, having important bearings on diagnosis and prognosis. Similar differentiation based upon character of densities can be made in pneumoconiosis separating silicosis sharply from anthracosis.

Discussion opened by Paul Dick, Chicago.

#### 3:00—"The Diagnosis of Bronchogenic Carcinoma" .....

1. Roentgen Aspects, A. Hartung and T. J. Wachowski,

University of Illinois, Chicago. 2. Bronchoscopic Aspects, Paul Holinger, University of

Illinois, Chicago.

The increasing recognition of bronchogenic carcinoma may be accounted for in large part by the aid roentgenology and bronchoscopy have furnished. In very early cases without definite physical or roentgen findings, bronchoscopic inspection is indispensable. Most cases come under observation when pathological changes have progressed to where they may be definitely demonstrated roentgenologically as to site, extent and concomitant secondary pathology. Bronchoscopy is necessary to establish its identity histologically. Findings observed in verified cases will be analyzed with a view towards evaluating their diagnostic significance.

Discussion opened by Willard Van Hazel, Chicago; F. Flinn, Decatur.

#### 4:00—"Some Roentgen Considerations of the Childhood Type of Tuberculosis" ....

Earl E. Barth, Northwestern University, Chicago

A roentgen study of the chest is indispensable in the examination of a child, suspected of having tuberculosis. Serial films will usually yield more definite information than a single or stereoscopic film. Two types of lesions should be looked for, the parenchymal and the tracheo bronchial. Parenchymal lesions may occur in any part of the lung and may be circumscribed or have a diffuse pneumonic appearance. Involvement of tracheobronchial lymph glands may be seen in masses which distort or protrude beyond the normal hilum.

Discussion opened by Edwin Rypins, Bloomington.

#### 4:30—"Ureteral Obstructions" .....

.....E. R. Crowder, Evanston

A discussion of some phases of the obstruction of the ureter as demonstrated with the intravenous urogram.

Discussion opened by Henry Grote, Bloomington.

5:00—"Distortion in X-Ray Films".....

.....Edmund Halley, Decatur

An x-ray film, being a complex silhouette record, is subject to many apparent inaccuracies in the representation of normal or pathologic anatomy. Awareness of the technical factors responsible for such distortion aids more accurate mental reconstruction of the part being examined. The subject falls into three classes; distortion, resulting from varied relation between energy source, object, and recording media; that due to different types of energy source (focal spot); and distortion inherent in recording media.

Discussion opened by D. P. Weins, Peoria.

*Thursday Morning, May 20, 1937*

#### BALL ROOM

Joint Session with Sections on Medicine; Surgery; Eye, Ear, Nose and Throat; and

Public Health and Hygiene

(See Medical Section for program.)

#### RULES GOVERNING PRESENTATION OF PAPERS

"All papers read by members shall be limited to twenty minutes and remarks in discussion to five minutes, floor privilege being allowed only once for the discussion of any one subject.

"All papers read before the Society or any of its Sections shall become the property of the Society. Each paper shall be deposited with the Secretary of the Section when read and the presentation of a paper to the Illinois State Medical Society shall be considered tantamount to the assurance on the part of the writer that such paper has not already appeared and will not appear in medical print before it has been published in the Illinois Medical Journal.

"A paper not heard in its scheduled turn shall be held subject to the call of the Chairman of the Section at the end of the regular session if time permits, or as an alternative at the end of the program.

"All subjects shall be confined strictly to the subject in hand.

"No paper shall appear in the printed transactions of the meeting unless read in full or in abstract."

(From the By-Laws of Illinois State Medical Society)

#### SCIENTIFIC EXHIBITS

Pere Marquette Hotel  
LOUNGE

J. S. Templeton, *Chairman*, Pinckneysville.

N. S. Davis, III, *Secretary*, Chicago.

Booth S1—"What the Public is Thinking About Health." American Medical Association, Thomas J.

Hull. An exhibit of mechanical material, posters and display files giving an analysis of 10,000 requests for information which have come to the American Medical Association from the public.

Booth S2—"Histology of Irradiated Tumors." Decatur and Macon County Hospital, Decatur. Perry J. Melnick, M. D., Ph. D., and Albert Bachem, Ph.D. Histologic changes in irradiated tumors, based upon an experimental study of 131 transplantable rat tumors irradiated by the various x-ray treatment methods. The results of chief interest are the demonstration of two different types of degenerative changes in irradiated tumor cells. One of these is known, and consists of a process resembling simple necrosis. The other occurs in tumors irradiated by divided dose methods, and consists of a change in the nuclei so that abnormal cell forms are produced which fail to survive and degenerate in a specific manner—a kind of lethal mutation.

Booths S3a, S3b—"The Chemistry and Pathology of Pneumoconiosis." Henry C. Sweany, Chicago. Antemortem, Postmortem and enlarged regional roentgenograms of different types of lung diseases caused by the inhalation of dust; pathological specimens to correspond, and exhibits of the various chemical procedures used in the analytical work.

Booth S4—"The Lesion of Lobar Pneumonia; A Clinical and Experimental Study." O. H. Robertson, W. D. Sutliff, and John P. Fox, University of Chicago, Chicago. Exhibit is divided as follows: 1. Early diagnosis shown by roentgenographic evidences and charts of physical signs in lobar pneumonia less than twenty-four hours after onset. 2. Evolution of consolidation shown by roentgenographic observations during the course of the disease in human beings. 3. Gross and microscopic lesions illustrating method of production of experimental lobar pneumonia in dogs. 4. Factors in recovery from lobar pneumonia in men and dogs. Schematic relationship of serum antibodies to the course of the disease. Photomicrographs illustrating the activity of polymorphonuclear phagocytes and macrophages in the clearing local lesions.

Booth S5—"Relation of Medicine and Surgery to the Railroad." James H. Hutton, G. G. Dowdall, W. T. Harsha, LeRoy H. Sloan, E. C. Olson, Wm. L. Culpepper, J. J. Gill, S. C. Hogan, H. W. Elghammer, Hugh N. MacKechnie, J. Quin, E. E. Madden, Everett M. Laury, Illinois Central Hospital, Chicago. This exhibit will consist mostly of charts showing types of cases, results of treatment, mortality tables. X-ray films reduced to a standard 5 x 7 size.

Booths S6a, S6b, S6c, S6d—"Research Studies in Morbidity, Mortality and Public Health Organization." The State of Illinois, Department of Public Health. Henry Horner, Governor; Frank J. Jirka, Director. The exhibit consists of a series of graphical illustrations which portray pertinent information about the epidemic characteristics, incidence of illness and of paralysis and geographical distribution of poliomyelitis; the reported prevalence, estimated and reported mortality, distribution, characteristics of patients and recommended treatment of syphilis; trends in maternal and infant mortality and its geographical distribution; or-



gization and functions of the State Department of Public Health.

Booth S8—"The Prevention and Relief of Heart Disease." Chicago Heart Association, Gertrude Howe Britton, Executive Sec'y. Charts and slides outlining important measures in the prevention and relief of heart disease, with special attention to rheumatic heart disease, periodic examinations, general treatment, including occupational therapy, rest, diet, convalescent care, and camps and classes for cardiac children.

Booth S9—"New Apparatus for the Registering of Heart Sounds. Using a Loud Speaker Unit." Edward W. Hollingsworth, Albert Sorensen, Albert Van den Briessche, Chicago. Apparatus for recording heart sounds in conjunction with electrocardiogram, by means of a magnetic speaker. Consists of a dynamic radio speaker without the cone, with amplifier, plugs for ear phones and loud speaker, the two latter being used to hear heart sounds as they are being graphically recorded. An electrocardiograph will probably be part of the exhibit.

Booth S10—"Cancer of the Tonsil, Pharynx and Larynx." Max Cutler, Michael Reese Hospital, Chicago. Symposium on Radium Treatment of Carcinoma of the Tonsil, Pharynx and Larynx. Photographs, Models and photomicrographs showing the methods employed in the Radiation treatment of Carcinoma of the Tonsil, Pharynx and Larynx. The indications for Radiation therapy and contra-indications will be demonstrated. Classification of these lesions and methods of treatment will be shown. Histopathology will be demonstrated.

Booth S11—"Public Health Aspects of the Cardio-vascular-renal Diseases." Metropolitan Life Insurance Company, Mr. Louis I. Dublin, New York. Thirteen placards illustrating:

1. Extent of Mortality.
2. Factor in Mortality.
3. Trends of Mortality.

#### PUBLIC LOBBY

Booth S12a—"Tonsillectomy." Paul A. Campbell, Chicago. Color moving pictures of some of the methods of tonsillectomy. Detail pictures are taken with telephoto lens and show technique in fine detail. A few pathological conditions of the tonsils are also presented in the film.

Booth S12b—"Exhibition of Poliomyelitis Film." Paul H. Harmon, Chicago. Illinois State Poliomyelitis Commission, Drs. Jirka, Harmon, Shaughnessy, Tucker and Levinson. A film showing:

1. Experimental work.
2. Criteria for early diagnosis.
3. Methods of Orthopedic reconstruction in anterior poliomyelitis.

Booths S13a, S13b—"Hemorrhage—Causes and Treatment." C. L. Birch, L. R. Linarzi, University of Illinois College of Medicine, Chicago. Chart of Classification of Hemorrhage. Colored photographs of clinical manifestations of hemorrhagic disorders. Demonstration of methods of blood typing and blood transfusion. Colored charts of blood pictures of the blood dyscrasias.

Booth S14—"Experimental Endocarditis Due to Pressor Reactions." A. J. Nedzel, University of Illinois College of Medicine, Chicago. Microphotographs, gross specimen, slides. Pitressin injections cause a stimulation of valvular endothelium (especially mitral) and the latter becomes adhesive. If there are floating bacteria in the blood stream, they may adhere and proliferate, leading to the development of true bacterial endocarditis. Pitressin injections cause changes in the subendothelial layers also. If no bacteria are present, the fibroblasts proliferate, building a defensive palisade of cells near the surface. Later, scar tissue and verrucae appear, with complete healing from the injury that has been inflicted to the valve.

Booth S15—"Relationship between Oral and Gastric Bacterial Flora." Robert W. Keeton, Lloyd Arnold and Marion Hood, University of Illinois College of Medicine, Departments of Medicine, and Bacteriology and Public Health, Chicago. Large 4 x 6 foot sized schematic representation of oral and gastric regions showing bacterial flora in color. Graphs for side walls illustrating detailed observations.

Booth S16—"Clinico-Pathologic Correlation." Milton G. Bohrod, St. Francis and Methodist Hospitals, Peoria. Charts, Photographs, Specimens and Photomicrographs of a group of interesting cases illustrating the correlations between clinical signs and symptoms and the pathologic changes found.

#### BALL ROOM FOYER

Booth S18—"Pathology of Tuberculosis and Tuberculin Testing. Technique of Diagnosis in Youth." Illinois Tuberculosis Association; Peoria County Tuberculosis Association, Fred M. F. Meixner, President. This exhibit comes from the Illinois Tuberculosis Association. It consists of nine large transparencies; one a flasher showing that tuberculosis is the foe of youth. Eight in order show the germ of tuberculosis greatly magnified, the circle of communicability between a tuberculosis patient and the object of infection, the formation of the primary nodule, the infection of the tracheo-bronchial lymph node; the development of active disease. Then there are transparencies to show the necessity for and the reaction to the tuberculin test and the fact that the tuberculin test must be followed by the x-ray.

Booth S19—"Demonstration of the Method of Application of Mecholyt and of Electropyraxia." D. E. Markson, D. Boyd, J. R. Merriman and S. L. Osborne, Northwestern University School of Medicine, Chicago.

1. Demonstration of method of application of mecholyt by common ion transfer (ionization) with the plethysmographic changes during such treatment.
2. The application of electropyraxia in the treatment of arthritis (fever machine, treatment bag, and special registering thermometer will be demonstrated).

Booth S20—"Measurements of the Peripheral Circulation by the Plethysmograph." Carl A. Johnson, St. Luke's Hospital and Northwestern University School of Medicine, Chicago. Demonstration with lantern slides and transparencies of the plethysmographic changes in normal individuals, in those with Buerger's

Disease, Reynaud's syndrome and aortic regurgitation after nerve block with novocain and application of heat locally.

Booth S21—"The Thyrotropic Hormone of the Anterior Pituitary Gland. Bio-assay by Graphic Analysis of Hyperplasia in the Guinea Pig Thyroid." Paul and R. W. Rawson, Northwestern University School of Medicine, Chicago. The exhibit will consist of:

1. Chemical Characteristics. Methods of preparing Solutions.
2. Method of Assay by Graphic Analysis of Hyperplasia of Thyroid of Test Animals.

- A. Variation in sensitivity of different species.

- a. Photographs of thyroids of dog, rat, rabbit, guinea pig, cat, cattle, sheep, hog.

- B. Other methods of assay.

- a. Animal metabolism apparatus.

3. Physiologic Effects in Animals.

- A. Acute effects.

- B. Prolonged injections; production of true experimental hyperthyroidism; illustrations of the complete clinical and physiological picture of hyperthyroidism in the guinea-pig.

- C. Production of exophthalmos by the thyrotropic hormone.

- D. Antihormone production by prolonged injection.

4. Bio-assay in man of occurrence of thyrotropic hormone in blood and urine.

- A. In normal men and women.

- B. During the menstrual cycle.

- C. In thyroid diseases.

- D. In pituitary diseases.

- E. Effects of Injection in man.

- A. Acute effects—use as a diagnostic test for hyperthyroidism.

- B. Variations in sensitivity in various endocrine types.

- C. Results in myxedema.

- D. Results in simple hypothyroidism.

- E. Attempt to produce antihormone control of clinical hyperthyroidism.

(Charts of B.M.R. curves in patients).

Booth S22—"Conical Pathological Exhibit of Cardiac Lesions and Multiple Myeloma." Arthur E. Mahle, Northwestern University School of Medicine, and Evanston Hospital, Chicago and Evanston. The exhibit, from the Department of Medicine and Pathology of Evanston Hospital, Northwestern University School of Medicine, shows: 1. Primary heart tumor with clinical resume and post mortem and pathological findings, microscopic sections (transparencies of tumor) 2. A series of hearts with above abstracts, transparencies, etc. Aortic stenosis. 3. Case of multiple myeloma with crystalline Bence Jones protein; x-ray pictures; microscopic sections, tumors and post mortem findings.

Booth S23—"Human Convalescent Serum—Preparation, Administration and Evaluation in Scarlet Fever, Measles, and Poliomyelitis." Sidney O. Levinson, Elizabeth Penruddocke, A.B., Albert M. Wolf, Samuel Deutsch Serum Center, Michael Reese Hospital, Chicago. This exhibit will consist of:

- (a) 12 photographs  $10\frac{1}{2} \times 8\frac{1}{2}$  demonstrating the steps of processing convalescent serum.

- (b) Three photographs of the Serum Center, showing special apparatus and equipment.

- (c) Models of pooling, filtering and bottling set-ups used in serum preparation.

- (d) Poliomyelitis kit used by diagnosticians.

- (e) 7-10 Charts  $18" \times 24"$  of tables and results.

Booth S24—"The Tense Patient in General Medical Practice."—Edmund Jacobson, Laboratory for Clinical Physiology, Chicago. Photographic records, charts and x-rays illustrating how tenseness in patients can be studied clinically and recorded in the laboratory.

## GALLERY

Booth S25—"Studies of the Incidence of Disease." Illinois State Planning Commission, Hon. Henry Horner, Governor, Mr. Robert Kingery, Chairman, Chicago. Charts illustrating incidence of various diseases in different parts of Illinois and its relation to economic and hygienic conditions in the areas.

## SECOND FLOOR ELEVATOR LOBBY

Booth S26—"Spondylolisthesis." Fremont A. Chandler and John R. Norcross, Northwestern University School of Medicine, Chicago. Exhibit to consist of demonstration of Spondylolisthesis by a series of  $5 \times 7$  negatives made from x-ray films, charts and photographs and the demonstration of large and small plaster models. The mechanism in the roentgenographic pictures of this lesion is demonstrated by both the films and the models.

Booth S27—"Renal Stone." Frederick Lieberthal, Department of Urology, Northwestern University School of Medicine, Chicago. A series of about 150 water color drawings and x-ray plates selected from several hundred cases of renal and ureteral stone, showing the pathologic changes which may occur in the disease and the relation of these changes to diagnosis and operative therapy.

## ROOM 204

Booth S7—"The Illinois Educational Program in Maternal Child Hygiene." State Department of Public Health, Illinois State Medical Society. Demonstration of Home Delivery Technic. Original illustrations utilized in Refresher Courses on the subjects of Puerperal Sepsis, Toxemias of pregnancy and obstetric hemorrhage. Statistical Charts on Maternal and Infant Death Rate in Illinois. Organization Charts.

## ROOM 205

Booth S31—"Carcinoma of the Tongue." Frank E. Simpson, Chicago. The exhibit will consist of three parts:

1. Radon applicators used in surface treatment; the radon bomb; model of radon machine with technic of making lead radon tubules for implantation.

2. Transparencies of cases treated, with histories and microscopic sections.

3. Motion picture of technic of treatment of carcinoma of the tongue.

## ROOM 209

Booth S17—"A Colorimetric Method for the Determination of Serum Magnesium." William S. Hoffman, Chicago Medical School, Chicago. The steps in the



micro-determination of serum magnesium will be shown, starting from the filtrate obtained by precipitation of calcium and showing successively the production of a trichloroacetic acid filtrate, the precipitation of magnesium 8-hydroxy-quinoline in specially designed centrifuge tubes, the washing of the precipitate, and the formation of a green-blue color with ferric chloride. The use of a photoelectric colorimeter (Cenco-Sheard-Sanford Photometer) will be demonstrated. Charts will be presented showing the curve of values obtained with the colorimeter, as well as those showing the concentrations of magnesium in health and disease.

Booth S28—"The Use of Perirenal Air Injections in the Diagnosis of Certain Adrenal Diseases." C. H. Drenckhahn and Cesare Gianturco, Carle Hospital Clinic, Urbana. The diagnosis of adrenal tumors and hypertrophies has always been difficult. From the clinical symptoms and physical examination, one is able to come to the conclusion that the adrenal glands may be at fault, but inasmuch as the adrenals are a bilateral organ, we cannot, by this method, scientifically incriminate one or the other. The use of perirenal air injections in the diagnosis of certain adrenal diseases was originally carried out by Carelli in 1923 in Rio de Janeiro. We have been following this procedure and have found it to be quite accurate in the diagnosis of hypertrophies and tumors of the adrenals. The purpose of this exhibit is to show some of these films with the clinical history corresponding to each film and to describe the technique in detail. Likewise, the value of this method to prove that the adrenals are normal in all cases of hypertension which are to come to surgery for splanchnic resection, or any other method of surgical nerve resection for hypertension, will be stressed.

Booth S30—"Collapse Therapy in Pulmonary Disease." Municipal Tuberculosis Sanitarium, Karl J. Henrichsen. Roentgenograms illustrating collapse therapy in non-tuberculous and tuberculous disease.

#### ROOM 222

Booth S29—"Fracture Exhibit." W. J. Potts, Oak Park. The various common fractures will be discussed, and the proper treatment will be outlined. Young men will be used as patients, and the plaster appliances adjusted for those interested. (A number of exhibitors will participate.)

#### EXHIBITORS AT THE 1937 ANNUAL MEETING

Arlington Chemical Company, Yonkers, New York.  
A. S. Aloe Company, St. Louis, Missouri.  
Bard-Parker Company, Inc., Danbury, Connecticut.  
The Borden Company, New York, N. Y.  
Chappel Bros., Inc., Rockford, Illinois.  
C. B. Fleet Company, Lynchburg, Virginia.  
Gerber Products Company, Fremont, Michigan.  
General Electric X-Ray Corporation, Chicago, Ill.  
H. J. Heinz Company, Pittsburgh, Pa.  
The G. F. Harvey Company, Saratoga Springs, N. Y.  
Horlick's Malted Milk Corporation, Racine, Wis.  
Kellogg Company, Battle Creek, Michigan.  
Lepel High Frequency Labs. Inc., New York, N. Y.  
Lederle Laboratories, New York, N. Y.  
Lea & Febiger, Philadelphia, Pennsylvania.

Libby, McNeill & Libby, Chicago, Illinois.  
J. B. Lippincott Company, Philadelphia, Pennsylvania.  
F. Mattern Manufacturing Company, Chicago, Ill.  
The C. V. Mosby Company, St. Louis, Missouri.  
The Medical Protective Company, Wheaton, Illinois.  
Middlewest Instrument Company, Chicago, Illinois.  
Mellins Food Company, Boston, Massachusetts.  
V. Mueller & Company, Chicago, Illinois.  
M. & R. Dietetic Laboratories, Inc., Columbus, Ohio.  
Mead Johnson & Company, Evansville, Indiana.  
Philip Morris & Co., Ltd., Inc., New York, N. Y.  
Pet Milk Sales Corporation, St. Louis, Missouri.  
Petrolagar Laboratories, Inc., Chicago, Illinois.  
Sutliff & Case Co., Inc., Peoria, Illinois.  
W. B. Saunders Company, Philadelphia, Pa.  
Universal Products Corporation, Pottstown, Pa.

#### NOTES ON EXHIBITS

The W. B. Saunders Company, at booth number 15, will exhibit a complete line of their publications. Of particular interest will be many new books and new editions, including a brand new, remade edition of Warbasse-Smyth's three volume work on Surgical Treatment. This work contains 3,000 pages and 2,500 illustrations, and covers the entire management and treatment of all surgical cases—medical as well as non-medical treatment.

Other important works in the surgical field are Bickham's seven volume, "Operative Technic," Christopher's "Minor Surgery," and the new Mayo Clinic Volume.

In the field of general medicine and the specialties, important new works include, "The Medical Clinics of North America," Levien's "Clinical Heart Disease," Wolf's "Clinical Endocrinology," Berens' "Eye Diseases," Curtis' three volume "Obstetrics and Gynecology," the new edition of Griffith and Mitchell's "Pediatrics," the new Sollmann's "Pharmacology," a new work on "Diseases of the Larynx," by Chevalier Jackson, and Tuft's new book on "Clinical Allergy."

Gerber's in booth number 16, cordially invites you to stop and see their two new products, Strained Apricot-Apple Sauce and Strained Liver Soup with Vegetables.

Gerber's have two types of literature, some for distribution to patients, and some for professional use only. Samples of the foods and the literature will be sent to registrants at the booth.

The proportion of maltose and dextrins in Mellin's Food, the protein and mineral content and the favorable effect of Mellin's Food on the digestibility of milk are distinctions that commend Mellin's Food as a modifier of milk for the feeding of infants and for the preparation of nourishment for adults requiring a restricted diet. Physicians are invited to call at our booth—number 2, to discuss their feeding problems.

A feature of the Mead Johnson exhibit, in booth number 17, will be a display of the Percomorph group of products; namely, Mead's Oleum Percomorphum, 50 per cent in liquid and in capsule form, and Mead's Cod Liver Oil Fortified with Percomorph Liver Oil.

Featuring Chappel Laboratories contributions in the field of liver and endocrine therapy; potent, highly refined, clinically tested, Chappel Pharmaceuticals have

set a new high standard for pernicious and secondary anemia preparations.

Chappel LIV-IRN preparations present a complete line of secondary anemia products in liquid, capsule and tablet form; while Chappel Concentrated Liver Extracts for pernicious anemias are in the Intramuscular, Subcutaneous and Oral form.

We welcome all members of the Illinois State Medical Society to visit our display at booth number 19.

The Medical Protective Company is represented at booth number 24 where you are invited to call. Medical Protective Service is an institution of the medical profession whose legal liability problems we have concentrated upon for 38 years.

Bring your professional liability questions and problems to booth 24. Our representative is at your service to present our protection plan, to explain the peculiar relation of the doctor to the law which governs your practice, or to discuss any particular phase of Professional Liability in which you are especially interested.

A number of new books will be displayed by the J. B. Lippincott Company (Booth number 25) including Emerson's "A Textbook of Medicine"; Pfandler and Schlossmann's "Diseases of Children"; McBride's "Disability Evaluation"; Hermann's "Passive Vascular Exercises"; Peham and Amreich's "Operative Gynecology"; and Kirschner's "Operative Surgery."

We will also display an entirely new work, just issued, on the "Thyroid and Its Diseases," by Means, showing the results obtained at the Thyroid Clinic of the Massachusetts General Hospital.

V. Mueller & Company in booth number 1, will have on display many new items, and they cordially invite you to spend as much time as you wish at their exhibit, inspecting the many recent developments in surgical instruments.

The Cold Cautery Scalpel should be of special interest, also the Shahan Ophthalmic light and Furniss intestinal Anastomosis Clamp. An extensive line of instruments for fractures and bone surgery will also be shown.

Mueller's exhibits are always interesting and instructive.

A. S. Aloe Company, in booth number 14, will display a general line of surgical instruments and equipment for the physician and hospital.

The new Aloe Short Wave Diatherm, the Elliott Treatment Regulator, the deBakey Blood Transfusion Instrument and the newly created Steeline furniture for the treatment room, will be featured.

Mr. V. Drennan, Aloe representative in this territory, will be in attendance to serve in any way possible.

In booth number 26, the G. F. Harvey Company will display some of our special preparations which are known as "Ethical Products for the Medical Profession."

Physicians are cordially invited to visit the new convention display at booth number 12, where Petrolagar Laboratories, Inc. will be represented by Mr. R. A. Beeson.

Petrolagar is an emulsion of pure mineral oil (65 per cent by volume) and agar-agar, accepted by the Coun-

cil on Pharmacy and Chemistry of the American Medical Association for the specialized treatment of constipation. Scientific drawings and literature on the subject of constipation will be available in addition to samples of the five types of Petrolagar.

While at the Illinois State Medical Society meeting, visit the Kellogg booth number 13 for a cup of refreshing Kaffee Hag Coffee. Bottle exhibits showing the stages in decaffeinating coffee are displayed, and complete explanation of the process is given. Reprints of reports covering research carried on at the University of Michigan to determine the effects of caffeine are available.

The exhibit is in charge of a representative of the Home Economics Department of the Kellogg Company.

A warm welcome awaits all physicians at the Borden booth, number 18. Especially trained representatives will gladly provide information on Borden products, notably DRYCO, Special DRYCO, KLIM, BETA LACTOSE, Merrell-Soule Prescription Products and Borden's Irradiated Evaporated Milk.

Be sure to stop at booth number 22 when you are visiting the technical exhibits and get a few very interesting and educational facts on the New Jones MOTOR BASAL unit.

It is Council accepted, guaranteed for life, contains no water, and embodies many exclusive features which will interest you.

At space number 27, in charge of L. E. Drury, Lea & Febiger will exhibit a number of important new works including:

Atkinson on the Ocular Fundus.

Brahdy & Kahn on Trauma and Disease.

Bond's Introduction to Medical Science.

Levinson & MacFate's Clinical Laboratory Diagnosis.

Werner's Endocrinology.

Wesson & Ruggles' Urological Roentgenology.

Davis' Neurological Surgery.

New editions of the following standard works will also be shown:

Bridges' Dietetics.

Cabot's Urology.

Cushny's Pharmacology.

Gifford's Ocular Therapeutics.

Kuntz on Neuro-Anatomy.

Rhinehart's Roentgenographic Technique.

Starling's Physiology.

Gray's Anatomy.

Holmes & Ruggles' Roentgen Interpretation and others.

You are cordially invited to visit the Horlick's Malted Milk Corporation Exhibit in booth number 3. Your attention is drawn to the special advantages of Horlick's Malted Milk as a nutritious, easily digested food-drink, often acceptable when no other food can be tolerated. Its special value will be pointed out:

1. For infant feeding.
2. For growing children.
3. For nursing mothers.
4. For the undernourished.
5. For the sick, especially in fever and ulcer diets.
6. For the convalescent.



## 7. In sleeplessness.

Libby's Baby Foods are prepared by a new and different method of homogenization, which breaks up the food cells and liberates nutriment for ready and easy digestion: roughage is reduced to tiny particles so that bulk is present for normal elimination without dangers of irritation. Doctors are invited to inspect these products at Libby's booth number 4. Pineapple Juice and Tomato Juice are being served.

Philip Morris & Co. Ltd. Inc., will demonstrate at booth number 23, the method by which it was found that Philip Morris cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than ordinary cigarettes in which glycerine is employed.

An actual working model of a milk condensing plant in miniature—every part constructed to scale—will be exhibited by Pet Milk Company in booths five and six.

It will show the method by which the milk is processed from the time it is received from the farmer until it is sterilized in the can ready for use.

The C. V. Mosby Company will exhibit its complete line of medical publications. Among the new editions to be shown for the first time will be the following:

Horsley-Bigger—"Operative Surgery."

Meakins—"The Practice of Medicine."

Mansfield—"Materia Medica."

Sadler—"Theory and Practice of Psychiatry."

Titus—"The Management of Obstetric Difficulties."

Hirschman—"Synopsis of Ano-Rectal Diseases."

Shands—"Handbook of Orthopedic Surgery."

Physicians attending the Illinois Medical Convention are cordially invited to inspect these, and other Mosby publications at booth number 28.

The Lederle Laboratories, Incorporated, displays in booth number 21, a number of outstanding biological and pharmaceutical products—Solution Liver Extract in 1 cc. vials for intramuscular use; Pollen Antigens, for the treatment of hay fever, in individual dose packages, and also in the more economical bulk packages; Globulin Modified Antitoxins, low in volume and with serum protein content greatly decreased; Vitamin B Complex and other important vitamin products. Literature, descriptive of these and all other Lederle products, will be available at the booth.

The exhibit of Sutliff & Case Company, Inc., to be found in booth number 11, will again feature their product "A-VITAM-UNG."

Many clinical reports have been received from all parts of the country showing the satisfactory results obtained from the use of this preparation in the treatment of burns, chronic ulcers, and infected wounds.

"A-VITAM-UNG" represents a successful blending of the primary form of Vitamin A in plant material into a sterile ointment base, and it contains approximately 2,000 U. S. P. XI units per gram of Vitamin A activity, which is thought to be the optimum concentration for stimulating granulation of denuded and abraded body tissue. Literature and demonstrations relative to the use of this preparation will be made a part of the display.

The Arlington Chemical Company, Yonkers, N. Y., in booth number 29, will feature their protein and

pollen extracts for diagnosis and desensitization of allergic conditions, especially the one dollar diagnostic pollen outfits and the \$25.00 and \$35.00 protein outfits. Their experts at their booth will be pleased to discuss any allergic problems.

H. J. Heinz Company, makers of the 57 Varieties, invites you to visit their new exhibit at booth number 7, featuring strained foods, breakfast cereals and olive oil.

Stop for a cold drink of Heinz Tomato Juice and register for the third edition of the Nutritional Chart. The two previous editions were so enthusiastically received that it was thought advisable to make frequent revisions in order to keep abreast with the rapid advances in the field of nutrition.

Lepel Laboratories will exhibit two Ultra-Short Wave Machines, a portable and an office model, and a Lepel Quartz mercury lamp, at their booth, number 8.

The dominant feature of the Lepel Ultra-Short Wave machine is that it uses fixed spark gaps, instead of vacuum tubes. Each machine is actually five machines in one, embodying as they do, in addition to the short wave therapy, circuits for desiccation, coagulation, cutting and the operation of both body and orificial quartz mercury ultra-violet lamps.

The Bard-Parker Company will demonstrate at booth number 30 the outstanding features of their Rib-Back blade incorporating new standards of cutting efficiency and economy.

Also will be shown a complete line of stainless steel scissors with renewable edges which eliminate resharpening, a selection of quality forceps with the Lahey lock and an interesting demonstration of Rustproof sterilization for surgical instruments with B-P Formaldehyde Germicide.

Fifty years of meritorious results are back of the name Phospho-Soda (Fleet). The elimination action of Phospho-Soda (Fleet) has been recognized and appreciated by generations of physicians. ACCEPT NO SUBSTITUTE. Samples will be supplied upon request at booth number 10.

At the Universal Products Corporation table you will find displayed SURGEONS' X-L-LYTE, a compact and serviceable diagnostic set, and not expensive. This set contains ear speculum, tonsil pillar retractor, tongue depressor, magnifying lens, and nasal speculum, with direct illumination for all.

Nickel silver curette, probe, ear spoon and applicator are included in the set.

The entire set is contained in a neat and serviceable leather case which is equipped with a hookless fastener.

F. Mattern Mfg. Company, Chicago, will be pleased to greet their friends in Booth number 9. In the display will be the Mattern self-contained Shockproof Motor Driven Combination Radiographic, Fluoroscopic and Bucky Tilt Table which places at the disposal of the Roentgenologist or physician a complete Diagnostic Unit for doing both Radiographic and Fluoroscopic work in any position.

The Mattern 30-60 Mobile Shockproof X-Ray Unit will also be featured in the exhibit. This Unit can be had in either 30 milliamperes or 60 milliamperes capacity at 90 Kilo-Volts. It is a completely shockproof

unit consisting of control stand; oil transformer; tube stand with shockproof tube housing on a mobile base, which is extremely light, very flexible and easy to move about whether in the office or in the hospital. The floor space occupied by this unit is 4 square feet.

All physicians attending the meeting are invited to inspect these excellent units, and the attendants will gladly give all available information relative to them, and to other Mattern equipment.

The new, lightweight, low-priced G-E Electrocardiograph will be exhibited in the General Electric X-ray Corporation's booth number 31.

This fine instrument will be of interest to every physician as will, also, the recently introduced Model "F" Ultraviolet Lamp—a better lamp costing less; the world-famous Inductotherm, and portable, shockproof X-ray equipment.

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#### EIGHTY-SEVENTH ANNUAL MEETING

PEORIA, ILLINOIS

May 18, 19, 20, 1937

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## LADIES' GOLF COMMITTEE

MRS. HUGH E. COOPER ..... *Chairman*  
    Mrs. J. T. Jenkins

Hay fever and asthma may be caused in many cases by molds. The author says that molds are second only to pollens as a cause of this disease. A series of 28 patients with allergy to molds were treated by specific mold desensitization with satisfactory results in 23. Feinberg, S. M., *J. A. M. A.* 107:1861, 1936.

The *Journal of the American Medical Association* reports the discovery of a drug that will enable a person to feel warm in cold weather. It is said to be almost as effective as reading the national debt figures. —*Hartford Courant*.

## PLIGHT OF AUSTRIAN PHYSICIANS

A letter from Dr. Karl Narbeshuber, president of the Austrian Medical Association, to the International Medical Association of Paris is an appeal for help from the physicians of other countries in the struggle of the Austrian physicians against sickness insurance. He declares that the Austrian physicians have struggled for a year and a half for their very existence against proposed reforms in sickness insurance; they are now appealing for support to the International Medical Association just as their confrères in Hungary appealed during the past year.

Sickness insurance is today everywhere almost the only field of occupation for the majority of physicians—it is their principal source of income, on which depend their fate and that of their families. Each alteration may prove fatal. There are today three great dangers that seriously threaten the very existence of a large section of the Austrian physicians: first, the great overcrowding of the profession; second, legislation suspending the rights of retirement; and, third, the reform of sickness insurance. To relieve the overcrowding, he asks that nations having colonies or protectorates open these for the immigration of young physicians. Relief for the second depends on legislation as to the physicians who are employed by the state or the city in the insurance systems.

In sickness insurance, fees have been greatly reduced: the fee for a consultation is between 10 and 15 cents; for a visit, between 25 and 50 cents; and the number of services that may be given are also limited. Everywhere the conditions of rural practice are constantly becoming more difficult, because the agricultural population has suffered enormously during the crisis.—*Jour. A. M. A.*

## DOZEN YEARS ADDED TO AVERAGE LENGTH OF LIFE

Eleven years have been added to the average man's life and 12 years to the life of the average woman, it is revealed by life tables of the U. S. Bureau of the Census.

At the beginning of the present century, the average length of life in the United States was 48 years for white men. Now, these new figures give an average life length of 59 years. For women the average life-time in 1900 was 51 years. Now it is nearly 63 years.

The added years of life are credited to "improved sanitation, higher standard of living, labor-saving inventions in the homes and the advances made in education and in the science and practice of medicine and surgery."

A surgeon, an architect, and a politician were arguing as to whose profession was the oldest.

Said the surgeon: "Eve was made from Adam's rib, and that surely was a surgical operation."

"Maybe," said the architect, "but prior to that, order was created, out of chaos, and that was an architectural job."

"But," interrupted the politician, "somebody created the chaos first!"—*Monsanto Current Events*.

## Original Articles

### THE SURGICAL TREATMENT OF PEPTIC ULCER AND ITS COMPLICATIONS

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ROCHESTER, MINNESOTA

Disregard of certain fundamental principles in the treatment of inflammatory lesions of the stomach and duodenum leads to dire results in many instances and may cast into disrepute those measures which, if properly used, have proved to be of extreme value. In the maze of conflicting reports that have emerged from the pages of medical literature, one is impressed with the sincerity of those observers who advocate diametrically opposed procedures and the tolerant attitude which is exhibited universally in the attempt to obtain a higher percentage of satisfactory results.

It is not to be expected that a satisfactory result will follow in all cases, even with the correct application of those measures which have proved their worth. There is an infinite number of extraneous factors in individual cases, and these factors are not completely understood. This does not justify, however, wholesale condemnation of all surgical procedures for peptic ulcer. There is a tendency to disregard the large majority of patients who have obtained satisfactory results, because one's viewpoint becomes somewhat warped by the unfortunate and not insignificant minority of cases in which secondary or recurrent ulceration has occurred, or cases in which the patients have not obtained a good functional result. As a consequence, a tremendous number of articles which have appeared have emphasized the problem, have contributed to the growing prejudice against surgical treatment, but have offered little toward its solution. A coöperative plan of attack between internist and surgeon has produced remarkable advances in the management of peptic ulcer and should reduce markedly the number of failures.

#### INDICATIONS FOR SURGICAL INTERFERENCE

*Gastric ulcer.*—The relationship between benign gastric ulcer and carcinoma of the stomach is highly controversial. Of significance is the fact that in a large number of cases of carcinoma of the stomach the history suggests peptic ulcer

and reveals that symptoms have been present a period of years. Of particular significance to the patient is the confession by competent roentgenologists that a small percentage of what seems both roentgenologically and clinically to be typical benign gastric ulcers may prove on microscopic examination to be malignant lesions. On gross examination, the pathologist is frequently uncertain as to the exact nature of the lesion, and obviously the gastroscopist would be subject to the same limitations. From a practical standpoint, therefore, a gastric ulcer should be viewed always with the suspicion of malignancy, and in most instances operation should be advised. Under exceptional circumstances, an attempt may be made to treat the ulcer conservatively, but an adequate indication for surgical interference is the failure of such a lesion to show, in not more than two weeks, definite improvement on roentgenologic examination. There should be complete relief from the symptoms of ulceration, and occult blood must be absent on repeated examination of the stool. Clinical improvement alone is insufficient to rule out the presence of a malignant ulcer, for the inflammatory reaction associated with such an ulcer may respond to the medical management and create in this manner a false sense of security. If the ulcer exhibits evidence of healing, conservative treatment may be carried on safely for an indefinite period provided a competent roentgenologist has the opportunity to determine the status of the ulcer at intervals which should not exceed two weeks.

Not infrequently, a lesion is situated so close to the pylorus that its exact nature cannot be determined. Usually, such a lesion will produce some obstruction to the outlet of the stomach and the question as to the advisability of exploratory operation is answered easily. Intractable pain, particularly pain which extends to the back, may necessitate surgical intervention for relief and as a precaution against perforation. The occurrence of hemorrhage from a gastric ulcer produces a situation which is similar in many respects to that which is produced by hemorrhage from a duodenal ulcer. This will be considered in the comment on the latter lesion.

*Uncomplicated duodenal ulcer.*—Surgical intervention for any disease may be advised only to relieve symptoms or to protect the patient against illness in the future. Because an ulcer of the duodenum rarely if ever is malignant, sur-



gical treatment of an uncomplicated duodenal ulcer is never urgent. In many instances, the ulcer apparently heals and remains healed if a properly formulated regimen is followed. Under ordinary circumstances, every effort should be made to control the ulcer in this manner; however, if the degree of disability is great, in spite of treatment, or if the patient cannot carry on for a reasonable time because of occupational or economic reasons, operation may be advised.

*Complicated duodenal ulcer.*—The most common complications of a duodenal ulcer are obstruction, hemorrhage and the tendency to perforate. Under ordinary circumstances, the occurrence of one or more of these complications warrants surgical intervention, although individualization is essential and arbitrary rules of conduct should not be adhered to. Pyloric obstruction may be noted on roentgenologic examination of the stomach in a case in which clinical evidence of such a condition is lacking. Surgical intervention before marked obstruction occurs will avoid the development of the great thickening and distention which result when the stomach attempts to empty itself against vigorous peristaltic action.

Repeated hemorrhage usually would justify exploration. One must not lose sight of the fact, however, that the source of the hemorrhage may be difficult to determine, and that hemorrhage may recur infrequently in spite of the removal of a lesion which has been incriminated as the source of the bleeding. The occurrence of a mild degree of hemorrhage on one occasion, in the absence of other symptoms, is insufficient evidence on which to advise surgical interference. If, however, hemorrhage recurs in such a case, in spite of every precaution, including rigid medical management and removal of all foci of infection, operation should be advised. Repeated hemorrhage will produce varying degrees of anemia, which may be extremely difficult to correct. Although hemorrhage from a duodenal ulcer is rarely of such proportions as to be fatal, the uncertainty creates an extremely bad mental situation for the patient, and in a large percentage of cases an operation under these circumstances will also protect the patient against the periods of incapacitation which invariably accompany the hemorrhages.

The tendency to perforation is usually made manifest by intractable pain and by roentgen-

ologic evidence of the formation of a crater, particularly if this is associated with an accessory pouch. Extension of pain to the back is suggestive of a penetrating lesion on the posterior wall of the duodenum. Hemorrhage may occur in association with a perforating lesion in spite of a widespread impression that such complications do not exist.

#### OPERATIVE PROCEDURES

*Gastric ulcer.*—It is not the purpose of this paper to describe operative technic, but to consider broad principles in the surgical management of benign ulcerating lesions of the stomach and duodenum. In most instances an attempt should be made to remove a gastric ulcer in as safe a manner as possible. If this is accomplished by means of a local excision, a gastroenterostomy also would be performed in order to assist in overcoming the inevitable interference in gastric motility that will be produced by the excision of the ulcer. In certain instances, a midgastric resection may be preferable because of the extent of the lesion. Removal of the greater portion of the stomach is preferable, and the adjacent lymph nodes should be removed if there is any suggestion that the lesion is malignant. It may not be possible to determine this accurately, so that the gross appearance and size of the lesion, the absence or presence of free hydrochloric acid in the gastric contents, and the history and general condition of the patient will have to be considered if resection is extremely difficult. The risk of such a resection may be greater than the possibility of malignancy.

*Duodenal ulcer.*—The surgical procedures that have been advocated for duodenal ulcer depend on many factors, chief of which are the presence or absence of complications, the age and sex of the patient, the chronicity of the lesion, and the amount of total and free acid in the gastric contents. If the patient is young, if there are no complications, and if the values for the total and free hydrochloric acid in the gastric contents are relatively high, the patient usually should be treated by conservative local excision of the ulcer with a plastic closure of the defect at the outlet of the stomach or by radical resection of a portion of the stomach. Any attempt under these circumstances to follow an intermediate course by performing a gastroenterostomy will result in a relatively high incidence of an ulcerating process in or near the anastomosis.

A patient who is more than fifty years of age, who gives a history suggesting the presence of ulcer for a long period, who has evidence of obstruction to the outlet of the stomach and a relatively low value for the free and total hydrochloric acid in the gastric contents is usually considered a favorable prospect for operation and is a good candidate for a gastroenterostomy. Between these two extremes are many patients who may not be classified in any particular category. One must consider the general make-up of the patient, the economic condition, whether the individual can and will follow advice, the relative risk of various procedures as compared to the possibility of obtaining a satisfactory result with conservative management, and then must attempt to reach an honest opinion as to which procedure offers the most. Promiscuous resection of the stomach for duodenal ulcer does not seem to be warranted. The risk of a fatal outcome with this procedure is probably greater than is the possibility of obtaining an unsatisfactory functional result or a recurrent or anastomotic ulceration with the more conservative surgical measures.

*Comment.*—There has been developing among physicians who are primarily interested in internal medicine, a gradually increasing prejudice against any operative procedure for duodenal ulcer. This is attributable in large measure to the fear of an anastomotic ulcer and to the risk of the more radical procedures. The series of cases of gastrojejunal ulceration reported in recent years supports the former fear and the mortality justifies the latter. In addition, advances which have been made in the medical management of duodenal ulcer have decreased slightly the number of patients who are favorable candidates for operative treatment. Advances also have been made in the surgical management of duodenal ulcer and the results, as shown in figures of large groups of patients, are most encouraging. This is particularly noteworthy when it is considered that operation is resorted to not infrequently as a last resort when medical management has failed. For this reason, in a relatively larger group of cases which are being seen by the surgeon, the prospects of a satisfactory result are not good. A true impression of the favorable results of operative treatment is not possible when the emphasis is placed with such force on the unsatisfactory results.

## CANCER

MAX CUTLER, M. D.

CHICAGO

*"Captain of the Men of Death"* is the well earned title of the disease which has come to occupy the center of the stage in one of life's most tragic dramas.

Among the vast organized republic of millions of cells composing our bodies, the process of cell division and cell death proceeds quietly and normally throughout the life of an individual. Some mysterious control exists over this beautiful and delicate balance of normal growth. Suddenly something disrupts this mechanism.

Thus cancer is nothing more nor less than a lawless uncontrolled growth of cells in some part of the body which refuses to obey the natural laws of structure and function. A group of "gangster" cells failing to observe the community interests of their neighbors run riot, invade the surrounding cells and cross boundaries which they should respect. Sometimes these lawless cells are content to invade only their immediate surroundings and never wander to distant parts. These more respectable groups form tumors. They may become quite large but they never break loose and do not travel to distant organs.

Other varieties are more vicious. They are not satisfied with merely invading their immediate neighbors. They break loose, enter the blood stream, lodge in distant organs and there set up other lawless colonies which disrupt the normal function of the body. These are the true cancers.

Exacting a toll of 160,000 lives annually in the United States and ranking second as the principal cause of death, exceeded only by heart disease, cancer has become a major problem of public health in the United States. Unlike other diseases, cancer is not self-limited. Insidious in its onset and steady in its progress, an untreated cancer pursues its relentless course to a fatal termination. It is the absolute certainty of this course of events that renders this disease a tragedy unequaled by any other ailment that affects the body.

Why are we so interested in cancer, and why are we planning such a mass attack upon this enemy? More than 1 out of 10 of all deaths which occur among our men and women are caused by cancer. Among men between the ages



of 55 and 70 at least 1 in 8 deaths is caused by cancer. Of all the women who die between the ages of 45 and 65, not less than 1 in 5 dies of cancer. It is reliably estimated that there are about 400,000 persons suffering from cancer in the United States at any given time. The aggregate loss of life is appalling. The death rate has increased about 65% since 1900. The importance of the subject does not need to be stressed. Its prevalence and the tragic distress associated with its advanced and terminal stages is only too well known to us all.

Although cancer affects men and women of all ages, it seizes man as a rule in the prime of life when the trained mind or hand is at its best and when he is of the greatest value to his family and community. The disease is found wherever man exists. No race is immune. No tissue or organ in the body is exempt.

What causes these cells to depart from their righteous ways and become lawless members of society? This has been well illustrated by an analogy given by Morley Roberts. He asks, what causes a cartridge to explode? *Why* it explodes is that it is struck with a detonator. That is the exciting cause. *How* it explodes involves the entire realm of the physics of matter and the nature of the molecule and atom. So it is with cancer. The *whys* of many forms of cancer are now well known. Cancer of the scrotum in chimney sweeps, cancer of the skin in tar workers and among the cotton spinners of Lancashire, cancer of the lung among the miners of Joachimstal who were exposed to arsenic and radium dust, cancer of the bladder among dye workers in Germany, cancer of the cheek in betel nut chewers and cancer of the mouth from chronic irritation. These are some of the *whys* of cancer.

Precisely *how* these various agents operate is a far more complicated matter and requires further research. Here the problem revolves about the nature of the cell and the response to its environment. It raises the fundamental question as to how a cell divides to form a new cell, how a newly formed cell is endowed with the property of further growth and division. It attempts to explain how the normal equilibrium between cells is disturbed. The problem is, therefore, very broad and leads us directly to the domains of physiology, chemistry, physics and biology; indeed, back to the very nature of life itself.

From careful studies of cancer in man it is evident that cancer results from a combination of factors. First the individual must be susceptible. This susceptibility is probably inherited. Cancer seems to appear in man as a result of certain external agents operating upon susceptible individuals. The precise manner in which these factors result in the establishment of cancer is just beginning to be understood.

Two recent discoveries in cancer research are of such apparent significance that there is scarcely a cancer research laboratory in the world that is not pursuing these leads. They are the discovery and isolation of certain cancer producing chemicals and the experimental production of cancer of the breast in male mice by means of one of the ovarian hormones. All cancer students agree that these observations are by far the most promising that have developed in the entire history of cancer research.

*Is Cancer Curable?* Cancer is curable. More people are being cured of this disease than is generally supposed. Patients who have been cured of cancer are reluctant to discuss it. Consequently, we hear more of the failures than of the successes. If it is true that cancer is curable, why does not this happy event occur more often?

The external cancers are both preventable and curable. These include cancer of the skin, lip, mouth, cervix and certain cancers of the throat. In spite of these facts, 60,000 men and women die each year in the United States of these external cancers. The internal cancers, such as cancer of the lung, stomach, intestine, liver and kidney yield not more than 10% cures largely because, failing to produce early symptoms, they make themselves evident only in their later stages after the disease has spread too far for complete eradication by our present methods of treatment. We do not have today any blood test for the detection of early cancer. One hundred thousand deaths occur every year in the United States as a result of internal cancer.

The last ten years, and more notably the last five years, have witnessed important advances in treatment and marked improvement in results in certain types of cancers. More powerful x-ray and radium apparatus and especially a better understanding of the basic principles by which these agents act upon cancerous tissues have revolutionized the technique of radiation and enhanced the possibilities of cure.

Thus far these advances have occurred only in the domain of external cancers which account for one-third of all deaths. There is some hope that the application of the new principles and techniques may also make some inroads into the larger group of internal cancers which account for two-thirds of the deaths.

In general it may be said that for the external cancers, x-rays and radium in expert hands accomplished 80 to 90% cures in early cases and 10 to 20% cures in advanced cases. These are some of the triumphs of radiation in the past ten years. This progress has not been easy nor rapid. On the contrary, it represents the most painstaking efforts of closely coordinated and perfectly organized groups of scientists over a period of almost twenty years.

When we consider internal cancers the picture changes. The cures in this group probably do not exceed 10%. Efforts to devise tests for the detection of internal cancers in their early stages and researches into the fundamental causes with the hope of prevention constitute important fields of cancer research.

*What Do We Mean by Cancer Research?* Cancer research may be divided into two parts: 1. *Clinical* research which has to do with the study of cancer as it appears in the patient. In pursuing this type of research one must utilize all sorts of laboratory aid, pathological, serological, chemical and biological. 2. *Experimental* research. This type of investigation has to do with studies of the nature of cancer and its causes.

The following examples are given to illustrate different phases of these two forms of research.

*Clinical Research.* The most important progress in the treatment of cancer during the last ten years has occurred in the fields of x-rays and radium. These agents have replaced surgery in certain forms of cancer and there are indications that other forms now requiring extensive operations may yield to these advances. Thus it is obvious that a department for radiation is in effect a center of clinical research. It must be equipped with the latest x-ray machines and radium apparatus. It must be manned by a highly trained personnel. It must have adequate facilities for diagnosis, treatment, follow-up examination and hospitalization. (Above all, it must be in a position to select (for study) those types of cancer which are under investigation regardless of the patient's ability to pay for ex-

pensive treatment or the necessity for prolonged free hospitalization. This department of clinical research has fully proved its value by the practical contributions it has already made to the curability of cancer. Of all the departments of clinical research this is the most active and most promising.

*Experimental Research.* Are we any closer to the explanation of the fundamental causes of cancer today than we have been in the past? Before attempting to answer this question it must be admitted that there are those who consider the fundamental causes of cancer to be so intimately bound up with the process of normal growth that they compare the solution of the fundamental causes of cancer to the explanation of life itself.

The majority of students of the subject however, hold a more optimistic point of view which they believe is justified by the history of the progress of medical research. Seventy years ago the cause of sepsis was as obscure as the cause of cancer is today and the discovery of insulin is only a recent event. As we study the progress of science we learn that the solution of certain problems awaits developments in related fields. Thus Lister's contribution to asepsis awaited Pasteur's discovery of living microorganisms.

About 160 years ago Sir Percival Pott of England discovered that cancer of the scrotum was common among chimney sweeps. Years later it was found that the workers in the cotton spinners' industry in Lancashire developed cancer of the skin where they were spattered with mineral oil by the revolving spindles. Soon afterwards it was noted that workers with tar and pitch developed warty growths on the hands which later turned into cancer. About twenty years ago two Japanese workers painted the ears of rabbits with tar and produced cancer of the skin experimentally. Thus it was observed that there was something in tar and pitch which had the property of producing cancer. What was this agent?

A group of chemists, chiefly in London, began to search for the underlying chemical agent. During the last three years their efforts have been crowned with success, for they have not only isolated the highly potent cancer producing chemical agents from tar but have succeeded in producing these chemicals synthetically in the laboratory. Of equal importance are the recent



experiments in which cancer in animals has been produced experimentally by the injection of certain hormones.

These two lines of research—the identification of cancer producing chemicals and cancer producing hormones—are now merging, since recent experiments seem to indicate that the underlying chemical factor responsible for the stimulus to abnormal growth may be the same.

*Cancer Institutes.* As early as 1792, Mr. S. Whitbread provided words in the Middlesex Hospital, London, for the reception of sufferers from cancer where, in the founder's happy phrase, they could remain until "relieved by art or released by death."

Cancer authorities and accredited cancer organizations have committed themselves to the policy of special cancer institutes and advise the establishment of a limited number of such units in the larger cities.

Actually, there exist in the United States today only three such organizations. Limitation of funds and inadequate personnel have been responsible for this deficiency. The development of special departments or tumor clinics in general hospitals on a comprehensive scale has also been retarded, chiefly by the scarcity of trained specialists.

These circumstances place us in the uncomfortable and unfortunate position of being unable to offer to most cancer patients the advantages of knowledge already gained and the results of recent progress. It has become perfectly obvious that the facilities for the modern treatment of cancer in this country are lamentably inadequate.

Some years ago the Rockefeller Foundation considered the advisability of assuming a greater interest in the cancer problem. After due consideration they decided that the possibilities of the problem at that time did not warrant this procedure. Important advances in diagnosis and treatment and the discovery of highly suggestive leads upon the fundamental causes of cancer during the last few years have combined to force a change in this attitude. It is, therefore, not only of interest but of considerable significance that the Rockefeller Foundation has this year allotted several million dollars to the Memorial Hospital of New York for the building of a new cancer institute. This gift at once implies an endorsement of the progress which

has been made in this field, an expression of confidence in its future possibilities and a recognition of cancer today as a major field of medical activity.

*Aims of a Cancer Institute.* The aims of a cancer institute may be separated broadly into three divisions: treatment, education and research. *Treatment.* (including diagnostic facilities). In a large general hospital composed of many departments, any specialty is in losing competition for space, equipment, personnel and funds with the major services of medicine and surgery. This is particularly true of cancer in which the requirements are especially exacting. General hospitals have not given the subject of cancer the consideration which it deserves and requires in order that it may develop and contribute fully to its own advancement.

Individual authorities and accredited organizations are thus in unanimous agreement that the most advanced form of cancer service is that provided by special cancer institutes where opportunity is provided for diagnosis, treatment and the collection of precise data. In such specialized institutes carefully controlled experimental trial of new methods and techniques can be easily conducted and the results made available to the entire medical profession.

Progress during the past five years has been such that radium and x-rays have replaced surgery in the treatment of certain operable forms of cancer. The result is that the surgeon is no longer the sole arbiter of the eventual cure of the cancer patient. The treatment of cancer has, therefore, ceased to be the function of an individual and has become the work of a group consisting of a surgeon, an x-ray specialist and a radium specialist. It is the need of collaboration of scientists and the necessity for team work which has resulted in the organization of special establishments dedicated to the treatment of cancer.

The second indication for these special organizations is the necessity of a complex and costly equipment, a large amount of space and a highly trained personnel.

The customary tendency of the surgeon or the x-ray or radium specialist working alone towards a cancer patient is to overestimate the value of his own method. When these three specialists work together their attitude is different. They will at once subordinate the prestige of

their particular method to the sole consideration of giving to the patient the best treatment that the circumstances permit.

Are the advances made with x-ray and radium in the treatment of cancer sufficient to warrant the creation of such establishments? Professor Claude Regaud, Director of the Curie Institute of Paris, states:

*"The substitution of radiological methods for surgical removal in a certain group of cancers is a conquest of science which of itself justifies the building of special establishments dedicated to its practical application under the most perfect conditions obtainable. The extension of its progress to other types of cancer is a reasonable expectation.*

"The perfection of the treatment is a condition of absolute prime importance. The first radium or x-ray treatment like the first surgical operation on a cancer has a character of fatality. It is decisive for cure or for death.

"The perfecting of service to the cancer patient demands a personnel of great experience, a costly equipment and a considerable amount of installation. It is, therefore, evident that such establishments for the treatment of cancer cannot be multiplied.

*"Surgeons and radiotherapists who undertake to treat curable cancers assume an exceptionally heavy responsibility, because the unique stakes which they play are the life of the patient himself. If these thoughts constantly haunted—as they should—the spirits of those who occupy themselves with the treatment of cancer, the effort of organization of this branch of medicine would be indicated by the quality and power of the institutions and not by their number."*

In 1929 a special committee of the American Society for the Control of Cancer reported upon the question of cancer institutes as follows:

"We have been forced to conclude that the treatment of many major forms of cancer can no longer be wisely entrusted to the unattached general physician or surgeon or to the general hospital as ordinarily equipped but must be recognized as a specialty requiring special training, equipment and experience in all arms of the service. We feel that the future development of cancer therapeutics will develop along the lines of concentration, organization and specialization. This view is by no means new. It is well known that the most conspicuous progress in the treatment of cancer has always been accomplished by specialists. *We recommend as an ideal well within the possibility of accomplishment the establishment of a limited number of cancer institutes. They should be located in large cities, be prepared to give the best modern treatment and offer facilities for research and education.*"

**Education.** Education involves dissemination of knowledge regarding various aspects of cancer among the general public, education of the practicing physician and the training of cancer specialists.

1. **Education of the Public:** The dissemination of correct information regarding the early signs of cancer is the function of specially organized groups. In America this phase of cancer control is admirably cared for by the American Society for the Control of Cancer. The presence of a cancer institute serves as a center for public education and raises the level of knowledge of the population in the immediate and surrounding communities. By cooperating with existing agencies, a cancer institute makes a direct contribution to public education.

2. **Education of the Physician:** Although the knowledge of the physician regarding cancer has improved somewhat in recent years, it is still wholly inadequate. It has been reliably estimated that a practicing physician in an average community sees but three cancer patients in the course of a year. To him, cancer is a hopeless disease. Since the general physician is the key-stone to cancer control it is of the greatest importance to set up the necessary machinery to overcome this deficiency. A more thorough training of medical students, increased attention to the subject in medical societies and frequent graduate courses in cancer are the available methods. A cancer institute at once becomes the center for these activities.

3. **Postgraduate Training:** Pending the establishment of an adequate number of cancer institutes and tumor clinics in general hospitals, a large proportion of the 400,000 cancer patients in the United States will continue to be treated at or near their homes. The responsibility of the care of these patients rests with surgeons, radiologists and pathologists. All three specialists are in great need of direction. There are no organized facilities in this country to cope adequately with this problem. It should be one of the prime aims of the institute to formulate a comprehensive program to meet this need. When it is recalled that in the treatment of cancer the question of cure or death rests solely with the skill of the specialist and that the first treatment by a surgeon or a radiologist seals the patient's fate, the emergency which exists is at once obvious.

A program to meet these needs must include:

1. Postgraduate courses for physicians already engaged in the treatment of cancer. This work must include courses in tumor pathology to render pathologists more competent in the



interpretation of early and borderline tumors and cancers. It should also include courses to those in charge of x-ray and radium treatment in various hospitals in order to familiarize them with the rapid advance in the use of these agents. There is an increasing demand on the part of the pathologists and radiologists for postgraduate opportunities.

2. The training of cancer specialists. This is best accomplished by the creation of fellowships for special training of young men with exceptional qualities and possibilities as cancer specialists. The Rockefeller Fellowships established in 1926 in the Memorial Hospital are an excellent example. There are many brilliant and promising young physicians in this country keenly interested in the cancer problem seeking opportunities in this field. Available fellowships do not begin to meet this demand.

*Research.* Cancer research may be divided broadly into two categories: clinical research and experimental research.

*Clinical Research* or the investigation of cancer as it is seen in the patient, includes also laboratory research undertaken to solve practical problems in diagnosis and treatment. Examples of clinical research are statistical studies upon such questions as heredity, efforts to devise diagnostic tests for early cancer, and the development of principles and technique of the application of x-rays and radium. This last type of research has already fully proved its value by the practical contributions it has made to the curability of cancer.

*Experimental Research* is concerned with an investigation of the nature and underlying causes of cancer. Although we are in possession of considerable data relating to the contributing causes of cancer, the ultimate cause of this disease remains an unsolved mystery. This type of research, dealing as it does with the fundamental problems of causation, is wide in its scope. It must necessarily extend into the domains of physics, chemistry, and biology. The program must be long-ranged. It must be undertaken only with the understanding that progress may be slow, that the ultimate solution may be distant but that each truth established may be the very link needed for the final solution of the problem. This type of basic research must go hand in hand with clinical and pathologic research and must be conducted in an institute where adequate

clinical material is available. It is essential that both branches of research be pursued simultaneously and in close cooperation, for each stimulates and helps the other.

*Principles of Organization.* Three circumstances have combined to stimulate interest in special institutes.

1. Renewed interest and activity in the cancer problem, resulting from recent progress in the field of cancer.

2. Urgent need of a cancer institute planned and organized upon a conception essentially different from existing organizations and in keeping with the present state of the cancer problem.

3. The availability of some of the recognized authorities of America and Europe to participate in this undertaking—a unique and unparalleled opportunity created by the unsettled European situation.

It should be the dominant spirit of such institutes that all considerations be submerged in favor of the purpose of the organization, namely, *unhampered and unrestricted opportunity for freedom of thought and action in all scientific endeavor.* In order to accomplish this purpose the organization must be based upon the following principles:

1. The institute must be completely equipped and adequately endowed in order that the cancer patient may be given the benefit of the latest developments in x-ray and radium technique and that further developments in technique may be possible and in order to permit the upkeep of equipment and adequate personnel necessary for clinical radiotherapeutic investigations and research.

2. The organization must be small but perfect. It must recognize the unhappy effects of size which carry in their wake the complications of overgrowth and over-organization which so often stifle and defeat the very purpose for which an organization is intended.

3. The staff of the institute must be chosen with the realization that upon this selection alone depends the success or failure of the project; that neither the building nor the size of the endowment but the background, training, experience, spirit, imagination and idealism of the leaders and their associates will be the determining factors.

4. The growth of the institute must be con-

trolled and limited solely by its scientific contributions and accomplishments.

*What May Be Reasonably Expected from a Cancer Institute Organized Along These Lines?*

1. A reduction in mortality through earlier diagnosis and more effective treatment resulting from education of the public and the medical profession, the training of specialists and the development of improved diagnostic and therapeutic methods.

2. Progress in our knowledge of the nature of cancer and its causation through clinical, pathologic and experimental research.

3. A contribution to the control of cancer, if not through sensational discoveries, then by a steady increase in our knowledge in the fields of cancer diagnosis, treatment, research and education.

THE GILLIES OPERATION FOR CORRECTION OF DEPRESSED FRACTURE DEFORMITIES OF THE ZYGOMATIC-MALAR BONES

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The management of fractures of the zygomatic-malar bones has always been given very minor consideration in the surgical literature. In most text-books, a few lines or a short paragraph is allotted to cover the entire subject. And unfortunately, the advice given has often left much to be desired.

Fracture of the zygomatic-malar bones produces one of the most common bony deformities of the face. The injury nearly always follows inward force against these bones applied from an exterior blow. Since the zygomatic arch is thinner, it is more often broken than the malar bone. However, fractures of either portion or a combination of both may occur.

*Symptoms and Diagnosis.* Since we are dealing with a depressed fracture, we always note a flattening of the cheek and an absence of expression on the affected side. If too much edema obscures this symptom, it can usually be found by palpation. Ecchymosis and tenderness are always found over the depression. One nearly always sees an irregularity of contour beneath the infraorbital ridge.

It may be further observed that the mandible is thrown towards the opposite side. Since the masseter muscle lies beneath the depressed bones, pain and difficulty in moving the lower jaw are quite characteristic.

The fracture is further identified by correct x-ray examination. These films will readily show the injury if a vertico-mental view, with the rays centered at right angles to the vertex, is made. The case illustrated (Figure 1), demonstrates this view quite nicely.

An alternative x-ray technique is carried out by the reverse procedure. With the film held on top of the patient's head, the rays are exposed from below. The head should be tilted slightly away from the injured side so as to make the



Fig. 1. (Left) Depressed comminuted fracture of zygomatic arch.



Fig. 2. (Right) Illustrating technique of operation. (Taken from Gillies.)



arch stand out from the lateral border of the skull. This of course, does not give a symmetrical view of both sides, but it will demonstrate the depression of the affected side very clearly.

It must be admitted, however, that with either technique, an occasional linear fracture without displacement may be overlooked, but the depressed variety, the type in which we are chiefly interested, always stand out very clearly.

*Treatment.* The early treatment of depressed fracture deformities of the zygomatic-malar bones has, in America, usually been carried out by one of two methods.

The first method consists of inserting a hook or threading a fine wire beneath the arch through the overlying facial skin. If the impaction is not too great, the fragments then may be elevated into normal position. The hazard of having the hook break off and become dislodged into the depths of the wound must not be overlooked, —indeed an embarrassing accident.

The second method may be criticized for disregarding one of the fundamental principles of plastic surgery, that is, to avoid creation of further defects to be added to the original deformity. The technique referred to is briefly that of open reduction by incisions through the cheek.

The third method of choice and the chief reason for the presentation of this paper, is that devised by Sir Harold Gillies of London. Although Gillies first described his method nearly ten years ago, there seem to be few surgeons in this country who are familiar with either its existence or the steps involved.

Preferably under general anesthesia, a small curved incision is made under aseptic technique through a shaved area in the temporal region. (Figure 2.) This should be made within the hair line, where the resulting scar will not be visible. The incision is carried down to the temporal fascia. The wound edges are then retracted while another small incision is made through the temporal fascia, thus exposing the temporal muscle. Through this opening a long thin elevator is passed downwards superficial to the temporal muscle until it comes to lie deep to the depressed zygomatic-malar bones. To those who have never performed this operation, they will be surprised to find that the elevator practically falls down through this plane by its own weight. Certainly, no force is necessary to place it and furthermore it is practically impossible for the

instrument to go in any but the desired direction.

Having once placed the elevator under the depressed bones, the scalp above the wound is then protected to prevent injury to either the overlying soft tissues or the skull beneath. Then, with the fingers of the opposite hand placed over the fractured area to follow the progress of the reduction, by simple levering movements the fragments can be quite easily manipulated into the corrected position.

In cases of old healed deformities, a similar technique may be followed, by first re-fracturing the bone with a thin bladed chisel passed through the temporal incision. The fragments can then be manipulated into the normal position as described above.

Having once reduced the fracture, it will stay there without additional aid because there is no muscular pull to displace it.

The temporal wound is closed without drainage with a few interrupted sutures and a sterile dressing applied.

Firm bony union in the fracture usually develops within three weeks.

545 Lincoln Avenue.

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## HUGE RETRO-VESICAL MYXOMA

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The myxomas are uncommon tumors, and may be found in subcutaneous tissues, submucous tissues, nerve sheaths, subserous or elsewhere. Many myxomas are sometimes classed as myxomas, but are in reality fibromas, or lipomas undergoing mucoid degeneration. The rarity of pure myxomas has led to the assertion, that such a growth does not exist, and certainly many so-called myxomas have been, in truth, merely the product of extensive mucoid degeneration in a fibroma or lipoma or other variety of connective tissue neoplasm.

Delafield states, "There is but little doubt that a true myxoma may occasionally be encountered."

Such tumors are usually jelly-like and translucent, and present great variation in microscopic appearance. They contain a mucin-like stroma with triangular branching cells, spindle cells and some of them irregular branching cells, the intercellular material containing mucoid

substance, and in some places look microscopically like umbilical cord. Very often as in our case, as seen in the photograph, they contain a large multilocular cyst and sanguineous fluid with encapsulated connective tissue, or covered with peritoneum and, as in our case, abundantly supplied with blood vessels.

Sometimes a large fibroma looks like a myxoma by degeneration which is caused by circulatory disturbance, and therefore the fibroma be-

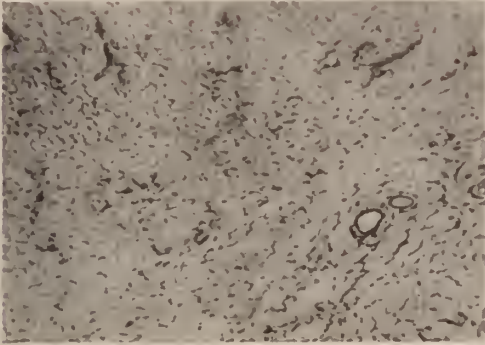


Fig. 1. Microphotograph of myxoma. Mucoid like stroma with spindle and stellated cells.

comes edematous, which causes dilatation of the lymph spaces, and this picture might be mistaken for a myxoma.

*History of a Case.* This patient was thirty-six years of age and had been ill for the past three years suffering from abdominal pain. Her menstruations were



Fig. 2. Photograph of myxoma weighing 5,426 grams.

normal, and her abdomen had progressively enlarged. There were no urinary symptoms.

*Physical Findings.* Slight systolic murmur; slight enlargement probably due to a circulatory disturbance from pressure symptoms. The appearance of the abdomen was that of an ascites or a twin pregnancy. No free fluid could be demonstrated. By external palpation part of the abdominal wall appeared fluctuat-

ing, while other portions had a firmer consistency. The bimanual examination revealed a normal uterus, retroflexed with a small fibroid the size of an egg. The uterus was compressed to the rectum. On both sides of the parametrium some soft cystic mass could be felt which extended to both lateral walls and abdomen, completely fixed on the lateral abdominal wall. It was immobile, and external examination feels that this tumor grows up to the diaphragm. It could have been a huge ovarian cyst, although we could not make a diagnosis and locate its origin from the ovary.

*Surgical Findings.* On opening the abdomen a huge mass presented itself. One side of this mass was hard and the other side consisted of a multilocular cyst varying in size from that of a grapefruit to that of a small egg. One or two of the larger ones were opened with a trochar when it was evident that the lower part of the tumor was extraperitoneal. When the cysts were opened the peritoneum was entered from the side, and we were able to reach beneath it and elevate the tumor. After the tumor was lifted out, and reflected between the legs, we could then see that this tumor started from the posterior wall of the abdomen, growing between the two parametria to both lateral walls of the abdomen, lifting the peritoneum with it and extending to both sides of the diaphragm. The whole tumor is covered with peritoneum. There were no adhesions between the surface of the tumor and the abdominal contents. We reflected the tumor back to the leg of the patient, and then we could see the uterus with a small fibroid on the right side. Both ovaries were normal, the tubes were both normal and the anterior surface of the uterus was normal also. There was absolutely no connection of this tumor to the tubes or ovaries, so this tumor originated in the connective tissue of the parametrium, and the posterior wall of the bladder. By operation, we dissected the posterior wall of the bladder from this tumor. The line of cleavage was easily found between the tumor and the posterior wall of the bladder. After opening both the parametria, a great number of blood vessels supplying the base of this tumor were ligated and then it was easy to shell out the half cystic and half solid masses from both parametria and from the lateral abdominal wall, so when the tumor was removed we could easily suture both layers of parametrium, and attach the bladder anteriorly by using a flap of peritoneum left on the bladder.

This patient made an uneventful recovery.

*Pathological Report:* (Dr. Laurence E. Hines).

*Gross.* Huge lobulated mass 32x26x24 cm. weighing 5426 gms. There is an ill defined capsule broken in many places. Approximately two-thirds of the mass is solid gelatinous, translucent substance, partly pale grey, partly purplish brown. The other third is cystic like communicating cavitations containing a small amount of blood stained fluid.

*Microscopic.* The bulk of the solid tumor is typical of vascular myxoma with spindle and star shaped cells in an abundant basophilic matrix. In parts of the tumor are found more cellular areas of fibroblastic cells arranged in the fashion of ovarian stroma. No



ovarian follicles are present. No part of the tumor appeared malignant.

*Pathological Diagnosis.* Retroperitoneal myxoma.

*Conclusion.*—A case of retroperitoneal myxoma resembling clinically a huge ovarian tumor is reported.

55 E. Washington St.

THE USE OF PHYSICAL THERAPY IN  
GENERAL OFFICE PRACTICE

A Report of 734 Cases

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We have been using physical therapy in the office extensively for four years during which time 682 patients have been treated on 734 different admissions. Many of these patients received a series of treatments, so that the number of treatments administered total 7586. The purpose of this article is to study and classify these patients to find out what results we are getting from physical therapy in order to seek justification for its use, both from the standpoint of expense to the patient and its value as a form of treatment.

This report is a study of a consecutive series of 682 patients, covering a period from May 21, 1934, to October 1, 1936, or approximately two and one-half years. Below is a table (Table 1) summarizing the entire series as to diagnosis, relative frequency, and results. Those cases classified as "treatment discontinued" were either discontinued by us because the result was unsatisfactory, the patient stopped coming either because of unsatisfactory result or because they hesitated to incur the financial burden of treatment, moved away, or because of intercurrent acute illness which rendered them unable to report to us. Subdivisions under the primary classification table will be discussed separately.

Each patient, before being subjected to treatment, submitted to a complete history and physical examination with a minimum standard amount of laboratory work, consisting of a urinalysis, red count, hemoglobin, white count, sedimentation time, Kahn test in every new patient, unless the acute nature of the illness prohibited such an examination or the obviously local nature of complaint made it unnecessary. Case notes were kept by dictation to a nurse at the time of check-ups to determine the result of ther-

apy. A nurse technician has been trained for several years in the administration of physical therapy.

TABLE 1

Disease Group	Num- ber	Improved	Cured	Unre- lieved	Treat- ment Discon- tinued	Not Com- plete
Rheumatic .....	174	106	31	13	22	2
Traumatic .....	105	32	65	1	7	..
Nervous functional. 71	47	5	7	10	2	..
Respiratory .....	64	31	27	4	2	..
Skin .....	62	23	34	2	2	1
Structural .....	57	34	9	2	12	..
Postoperative .....	49	20	22	2	..	5
Vascular .....	47	37	4	..	6	..
Nervous organic... 31	14	8	1	8	..	..
Gastrointestinal ... 29	19	1	5	3	1	..
Surgical infections.. 19	5	12	1	..	1*	..
Miscellaneous .....	26	13	6	5	2	..
	734	381	224	43	74	12

\*To hospital.

Table 2 shows the relative frequency or popularity of the various modalities in our work:

TABLE 2. TYPES OF TREATMENT

Massage .....	4143	Bristow coil .....	465
Diathermy .....	3205	Cupping .....	418
Infra-red .....	2791	Galvanism .....	343
Ultraviolet .....	2497	Autocondensation .....	260
Photo therapy .....	1848	Vacuum electrode .....	153
Hot packs .....	1326	Relaxation (Jacobson)..	143
Vibrations .....	956	Colonic irrigation.....	81
Sinusoidal .....	640	Saturation bar .....	19

The relationship of mind and body and the importance of functional abnormalities, such as posture, environmental and emotional factors, work, rest, glandular disturbances, are taken into account and correction attempted in the management of a patient's recovery. For example, a patient may come in with chronic appendicitis and at the same time have well marked symptoms of a psychoneurosis. If one is too surgically minded and considers only the appendix and removes it, one still has a sick patient who has not recovered completely after the diseased appendix is removed, because the functional factor has not been treated. Again, a patient may have a functional disturbance resulting from poor posture causing referred pain or a functional glandular disturbance which must be adequately treated if we are to obtain relief from all symptoms. The greatest part of our medical training has been from a structural or organic disease standpoint, and many failures in handling patients result from such an attitude of ignoring or inadequately treating functional disturbances.

With this idea of comprehensive treatment, we

cannot rely on drugs alone, or surgery alone, because it is rare in an examination of the chronically ill patient not to find five or six secondary diagnoses in addition to the primary. These secondary diagnoses are most influential and often require other therapeutic armamentaria besides drugs and surgery.

Unconsciously in the past, we have used many physical agents without regarding them under the name of physical therapy, such as the mustard plaster, the hot moist application, the use of liniments with their associated massage, the use of exercise, hot soaks, baths, visits to sanitarium. The stimulus from legitimate advertising by commercial concerns has directed attention to the subject. Medical journals are filled with advertisements of various types of diathermy machines, fever machines, vaginal heat treaters, various forms of lights. All of these instruments have their place in the field of physical therapy. Their relative importance is determined somewhat by the type of practice in which the doctor is engaged.

Physical therapy is not a specialty, or at least it should not be, because it is a branch of therapeutics with certain measures applicable in each of the specialties and also in general practice. Each group should master and apply those modalities from which it can obtain value in its type of work. Therefore, in our office, we felt our way slowly, adding physical therapy apparatus for treatment only where a definite need of a new modality was indicated after we had made ourselves familiar with its applications and limitations.

Our scientific apparatus now consists of two diathermy machines of the ordinary wave length type, a sinusoidal and galvanic current Wantz generator, a galvanic wall plate, several hand therapeutic lamps, a large phototherapy lamp, an ultraviolet lamp, a Bristow coil, a high frequency electrode, an autocondensation couch. I can see no reason at the present for changing to short wave machines in view of a recent conservative report of Kovacs.<sup>1</sup>

The nurse technician in charge of the work keeps the records and case notes and cooperates closely with the physician in managing the patient. No case is submitted to her for physical therapy without a diagnosis. A record card with the diagnosis thereon is filled out and kept in a card index. It stimulates the interest of the

nurse to know the physician's diagnosis and to have an understanding of the indications for treatment which she is carrying out. Case records kept on a simple card make material for study of results, and when reviewed, help to crystallize in the physician's mind his opinion concerning the value of the procedures used in treating certain types of disease. In order to have close liaison between nurse and physician, patients must be seen frequently, daily in some cases, but at least once a week in more chronic types of patients and where a less frequent interval will give a better perspective as to results. The human element evidenced in the form of a physician who understands the principles involved plus a skilled technician devoting full time and interest to her work, carrying out the physician's prescriptions, I think is the most important single factor in the successful use of physical therapy.

Our experience in this locality with our type of practice is that the psychoneuroses make up a major or secondary diagnosis in 50% of patients seen.

TABLE 3

Nervous	Num-			Unre-	Treat-	Not
Functional	ber	Improved	Cured	lieved	Discon-	Com-
Psychoneurosis . . . .	28	19	2	3	4	..
Neurosis of colon . . .	26	21	1	1	3	..
Neurasthenia . . . . .	9	3	..	1	3	2
Coccydynia . . . . .	6	3	2	1	..	..
Constitutional inferiority . . . . .	2	1	..	1	..	..
	71	47	5	7	10	2

Table 3 above shows the sub-groupings in this category with the results of treatment. We can relieve these people, but 47 out of 71 improved show that cure, in our experience, is rare. The best approach to these patients for the doctor not especially trained or limiting his work to psychiatry is primarily on the plan of reassurance, persuasion and physical therapy. Drugs are only of temporary value, usually in the form of bromides and phenobarbital. Physical therapy usually takes the form of phototherapy, tonic ultra violet radiation with sedative or stimulative massage. Galvanism and diathermy are often helpful in the paresthesias and neuralgic pains of which these patients have many.

We have noticed a definite seasonal incidence in the types of patients to whom physical therapy is of use. In the spring and fall, an influx of



arthritic cases and head colds occur, or we may see a string of four or five herpes zoster cases. Acute head colds are treated by neosilvol packs and exposure to the phototherapy lamp for one-half hour with atropine internally. The herpes respond well to ultraviolet light. The first icy spell brings a crop of fractures with their necessary physical therapy. A spell of hot weather will bring in quite a number of acute fibrosites, sore shoulders, wrynecks and various muscle pains and catches due to lying exposed at night to a draft blowing in from open windows.

The three largest classes of patients that we have to treat are the rheumatics, the traumatic cases and the functional nervous group, as seen from Table 1. In the rheumatics, physical therapy in justice to the patient can certainly not be left out. A well rounded regime of diet, rest and therapeutic exercise, drugs of the anodyne type, diathermy and skilled massage to eliminate areas of fibrositis and adhesions around joints will improve a high enough percentage to make it very much worthwhile. According to Table 4, 61 out of 79 cases were either relieved or cured.

TABLE 4						
	Num- ber	Improved	Cured	Unre- lieved	Treat- ment Discon- tinued	Not Com- plete
Rheumatics						
Arthritis	79	58	3	8	9	1
Myositis	69	33	25	2	9	..
Periarthritis	14	6	2	3	3	..
Sensitive deposits	9	7	..	..	1	1
Torticollis	1	..	1	..	..	..
Lumbago	1	1	..	..	..	..
Bursitis	1	1	..	..	..	..
	174	106	31	13	22	2

Our ambulatory fracture cases receive physical therapy very early at the office. In the Colles' fracture, the anterior and posterior splints are removed the second day, and relaxed motion with sedative massage is started with daily treatments thereafter, as recommended by Mennell.<sup>2</sup> In the average case with a good reduction, all splints are off and the patient has full use of the hand in three weeks. Other types of fractures are treated very early, in most cases by simple baking, massage and muscle stimulation by the Bristow coil. Other types of trauma are a favorite field for physical therapy, as shown in Table 5.

Low back conditions make up another secondary group not as large as the above three. After a thorough physical and x-ray examination to rule out other organic trouble, these cases usually

TABLE 5					
	Num- ber	Improved	Cured	Unre- lieved	Treat- ment Discon- tinued
Traumatic					
Fractures	40	14	25	1	..
Sprains	27	4	18	..	5
Lacerations	14	3	9	..	2
Contusions and abrasions	10	3	7	..	..
Burns	5	2	3	..	..
Dislocations	4	1	3	..	..
Foreign bodies	2	2	..	..	..
Severed tendon	1	1	..	..	..
Severed nerve	1	1	..	..	..
Sunburn	1	1	..	..	..
	105	32	65	1	7

are treated by infra-red, followed by diathermy, then stimulative massage, dry cupping and muscle contractions, and an adequate support is of course fitted. Manipulative treatment is also used. With this combination, a very unsatisfactory type of case is relieved, as seen in Table 6, in which group we have included flat feet and poor body mechanics cases which will aggravate or tend to produce low back pain.

TABLE 6					
	Num- ber	Improved	Cured	Unre- lieved	Treat- ment Discon- tinued
Structural					
Weak feet	33	21	4	..	8
Sacroiliac strain	17	8	5	1	3
Poor body mechanics	4	2	..	1	1
Lumbosacral strain	3	3	..	..	..
	57	34	9	2	12

All open wounds, ulcers, boils, localized infections, etc., receive one-half hour of infra-red with ultra-violet for stimulation of wounds where indicated before the dressing. The results are shown in Table 7.

TABLE 7					
	Num- ber	Improved	Cured	Unre- lieved	Not Com- plete
Surgical Infections					
Extremities	17	5	11	..	1*
Abscess—breast	1	..	1	..	..
Fistula in ano	1	..	..	1	..
	19	5	12	1	1

\*To hospital.

Fresh industrial wounds are soaked in soap solution and baked with infra-red, avoiding the use of any antiseptics, as recommended by Koch.<sup>3</sup> We have found very satisfactory healing free from suppuration using this method.

The field of skin disease is a large one, as the number of cases in Table 8, below, shows and the results are highly satisfactory as shown by the few unrelieved or the patients on which treatment was discontinued.

TABLE 8

	Num-ber		Unre- lieved	Treat- ment Discon- tinued	Not Com- plete
Skin	Improved	Cured			
Furunculosis .....	20	7	12	1	..
Dermatitis .....	16	9	5	1	1
Herpes .....	15	3	11	1	..
Acne vulgaris .....	4	3	1	..	..
Impetigo .....	3	..	3	..	..
Erysipelas .....	2	1	1	..	..
Erythema nodosum ..	1	..	1	..	..
Pruritis estivalis ..	1	..	1	..	..
	62	23	34	2	1

The use of the combination of drugs and physical therapy in respiratory disease has been popular in shortening duration and relieving symptoms.

TABLE 9

	Num-ber		Unre- lieved	Treat- ment Discon- tinued	Not Com- plete
Respiratory	Improved	Cured			
Rhinitis .....	21	10	9	2	..
Bronchitis .....	16	10	5	..	1
Sinusitis, acute .....	11	2	9	..	..
Asthma .....	5	5	..	..	..
Tonsillitis .....	5	1	4	..	..
Tuberculosis .....	5	2	..	2	1
Bronchiectasis .....	1	1	..	..	..
	64	31	27	4	2

Postoperative cases are listed in Table 10 and consist of surgical cases which need special building-up after operation for loss of weight, poor appetite, anemia, persistent drainage, etc. They receive ultraviolet light and generalized massage.

TABLE 10

	Num-ber		Unre- lieved	Not Com- plete
Postoperative	Improved	Cured		
Postoperative treatment...	46	18	22	1
Adhesions, postoperative...	3	2	..	1
	49	20	22	2

The ultraviolet light has been a valuable aid in the chronic conditions associated with secondary anemia. Pernicious anemia also receives this aid. The hypertension cases shown in the vascular group have responded temporarily at least to autocondensation in a high percentage.

TABLE 11

	Number		Unre- lieved	Treat- ment Discon- tinued
Vascular	Improved	Cured		
Secondary anemia .....	23	15	3	5
Hypertension .....	20	18	1	1
Pernicious anemia .....	3	3	..	..
Buerger's disease .....	1	1	..	..
	47	37	4	6

The gastrointestinal group is shown in Table

12. In visceroptosis and intestinal stasis, measures are used to build up the abdominal muscles by massage and sinusoidal contractions to the abdomen.

TABLE 12

	Num-ber		Unre- lieved	Treat- ment Discon- tinued	Not Com- plete
Gastrointestinal	Improved	Cured			
Visceroptosis .....	9	7	1	..	1
Intestinal stasis...	4	2	..	1	..
Ulcerative colitis...	2	..	..	..	..
Ulcer, peptic .....	2	2	..	..	..
	17	11	1	3	1

In the genitourinary field, the only thing we have treated consistently has been the enlarged prostate. Twelve cases were treated with diathermy with the rectal electrode. Eight cases were improved as evidenced by lessened frequency and residual urine, decrease in the size of the prostate. Two were unimproved and two cases treated were discontinued before an adequate amount of treatment had been administered. These patients were usually given twelve treatments, three times a week, of diathermy to tolerance and then opinion formed as to whether the treatment was getting results. The only conclusion we can reach from this small group of patients is that a certain number can be relieved, at least temporarily.

Nervous disease, organic in nature, shown in Table 13, contains a large group of intercostal neuritis cases which are relieved readily by baking and diathermy.

TABLE 13

	Num-ber		Unre- lieved	Treat- ment Discon- tinued
Nervous Organic	Improved	Cured		
Neuritis, intercostal .....	17	6	6	1
Sciatica .....	7	4	1	..
Neuritis, traumatic .....	2	2	..	..
Paralysis agitans .....	2	..	..	2
Neuritis, peripheral .....	1	1	..	..
Radiculitis .....	1	1	..	..
Bell's Palsy .....	1	..	1	..
	31	14	8	1

The final group of miscellaneous cases, twenty-six in number, are not classified under the above headings. There is usually only one case of a kind and such as do not warrant separate discussion.

The use of surgical diathermy in moles, warts, skin malignancies, etc., in office practice is very useful, but no tabulated record of these



cases was available for discussion. The medical diathermy machine of the type used by us makes the surgical current, either desiccation or coagulation, available for use in suitable cases.

TABLE 14

Miscellaneous	Num- ber	Improved	Cured	Treat- ment	
				Unre- lieved	Discon- tinued
Obesity .....	6	6	..	..	..
Malnutrition .....	2	..	..	2	..
Alcoholism, chronic .....	1	1	..	..	..
Cervical adenitis .....	1	..	1	..	..
Climacteric melancholia....	1	1	..	..	..
Cyst, thigh .....	1	..	1	..	..
Coronary sclerosis .....	1	1	..	..	..
Carcinoma, basal cell....	1	1	..	..	..
Hernia .....	1	..	..	..	1
Hyperthyroidism .....	1	..	..	1	..
Hypothyroidism .....	1	1	..	..	..
Enlarged lymph nodes....	1	..	..	..	1
Lymphosarcoma .....	1	..	..	1	..
Lymphatic leukemia....	1	..	..	1	..
Nausea of pregnancy....	1	..	1	..	..
Pneumonia convalescent..	1	..	1	..	..
Rickets .....	1	1	..	..	..
Retention cysts, ovary....	1	..	1	..	..
Serum sickness .....	1	..	1	..	..
	26	13	6	5	2

The above tabulated report of types of cases and results will give an idea of the versatility of physical therapy in office treatment. We feel that results justify the time and exercise involved, because it fills in a gap in the handling of certain conditions not met by medicine or drugs alone. We believe, however, that certain principles must be adhered to. Every patient submitted to physical therapy must receive a careful examination and adequate diagnosis. Physical therapy is only one branch of therapeutics and should only be used where indicated. A trained technician who can devote full time and interest to her work is the only way in which it can be satisfactorily administered. Careful check-up and follow-up notes to keep in close contact with the patient are necessary. In our experience, we have found that if these criteria are followed, physical therapy is a very important and satisfactory adjunct to the practice of medicine.

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## RAW APPLE DIETARY IN THE TREATMENT OF DIARRHEA COMPLICATING MELENA NEONATORUM

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The beginning of the study of raw apple feeding as a dietary in the treatment of diarrhea in infants and children dates from the appreciation of Moro's<sup>1</sup> clinical observations in his children's clinic. Moro published his work in 1929. At about the same time Heisler<sup>2</sup> assembled a large series of case histories from an accumulation of clinical notes taken during many years of private practice and reported his experience in the use of a similar diet. This report, and the report of Moro, focussed the attention of European clinicians on the new dietetic method. Questions were asked concerning the rationale of the therapeutic measure and Moro and Heisler each answered that raw apple pulp, when finely sieved, is a non-irritating substance which mechanically inhibits peristalsis and that, hypothetically, it possesses absorbent and detoxifying properties.

During the following several years numerous European investigators corroborated the work of Moro and Heisler and extended the study in a rapid succession of clinical reports. Among these Malyoth<sup>3</sup> attempted to show that pectin and cellulose are the two active therapeutic ingredients in apple, and Schreiber<sup>4</sup> studied the intestinal flora before, during and after apple feeding and noted a decrease of pathogenic organisms coincident with an increase of bacillus coli.

In America the hopeful claims of Moro and his followers have been put to the test of clinical experience in a series of studies undertaken in various clinics and in the private practice of many physicians. And if the reports of Birnberg,<sup>5</sup> Kaliski,<sup>6</sup> Giblin and Lischner,<sup>7</sup> Borovsky,<sup>8</sup> and others concerning the therapeutic value of the dietary may be taken as typical of the experience of American investigators it would appear that response to treatment occurred more rapidly and somewhat more consistently with apple diet than with other methods. Just as the earlier European investigators had reported, cases of infectious diarrhea responded as beneficially as the non-infectious, parenteral diarrhea as promptly as enteral. Success engendered confidence, and confidence passed easily into enthusiasm.

European and American clinicians have thus

traced the progress of apple feeding therapy in chronicles of achievement. Telepathically they may have heard mutterings of criticism against a dietary which, while breaking all the rules of infant feeding, had some of the characteristics of a speculative clinical sortie, but their enthusiasm has not yet been dampened by the publication of adverse reports in the literature of science. And so, lately, the proponents of a newer therapy have unhesitatingly widened the scope of the method's usefulness. The strength of the proponents' case lies in the circumstance of repeated success, even and especially when diarrhea is severe; its weakness lies in the fact that the reasons underlying success remain vague and undeveloped.

If it is too early to view this new dietetic method in its correct historical perspective, it is at least permissible to ask whether the method is unlike many other therapeutic innovations in which early, enthusiastic and sometimes over-enthusiastic preliminary reports prepared a necessary background against which a more effective and perhaps a more rational therapy took form. Even now the sketchy outline of a more effective therapy is visible in the recent report of Winters and Tompkins.<sup>9</sup> These investigators, accepting the hypothesis of Malyoth<sup>10</sup> that pectin and cellulose are the active principles in apple so far as therapy of diarrhea is concerned, devised a substitute feeding in which pectin, obtained from the peelings of citrous fruits, and cellulose, obtained from agar-agar, were combined with dextrin-maltose, the latter to provide calories. The mixture was sterilized by boiling in water or milk. In a series of cases which included Flexner dysentery and Sonne dysentery, the substitute feeding was alternated with apple-treated patients as controls. The substitute group responded faster and with less loss of weight.

The purpose of the report which follows is, first, to suggest that in certain cases of non-infectious diarrhea, as in the case cited here, there is unmistakable clinical if not yet laboratory evidence that recovery is hastened because the diet promotes the retention of body fluids, and not solely or even essentially because of the absorbent and detoxifying properties of apple, as has been commonly assumed; and, second, to indicate an extension, in lower age limit and in pathologic condition, of the already broad field in which the

therapeutic principles of the raw apple or pectin-agar diets may be applicable.

Melena neonatorum is not a common clinical entity, its incidence, according to Gerhardt-Seifert<sup>11</sup>, being less than 0.05% of births, but it is a disorder with considerable mortality figures. Vassmer<sup>12</sup> stated that when hemorrhage is confined to the bowel, and there are no complicating factors, the mortality rate is 10%; but one infers from what von Reuss<sup>13</sup> has to say of frequent loose stools during the course of melena that diarrhea is a serious complication which may be expected materially to increase the mortality rate.

In sifting the literature no report has been found of a case of melena neonatorum complicated by diarrhea in which raw apple feeding was given to control diarrhea; nor is there any record in the available literature indicating the use of this dietary as early as the third day of life in diarrhea of any origin.

#### CASE REPORT

*History.* On October 7, 1936, the infant, a male weighing 3650 grams, was born at Passavant Hospital. The delivery was a normal and easy one at the anticipated term. There was no evidence of asphyxia. The mother, a multipara, had a negative Wassermann reaction.

During the first thirty-six hours of life the infant's appearance and actions were those of a normal newborn. His color was good; he cried lustily; took water freely, nursed vigorously when put to breast, and evacuated normal appearing meconium at intervals of about eight hours.

Toward the end of the second day a large stain of blood appeared on the diaper, and the infant's buttocks were covered with bright red blood. Throughout the following twelve hours an almost continuous ooze of unchanged fluid blood seeped into the diaper, and clots and strings of coagulated blood were passed frequently.

Beginning early in the morning of the third day, meconium, at first streaked with blood and later with blood and mucus, was passed at intervals of less than an hour. The nursery nurse recorded twelve stools in a period of ten hours, and an alert supervisor noted a change in the character of the stool from the typical, tenacious, bluish-green of meconium to a dark brown, semifluid evacuation. During this time convulsive twitching began. There was no hematemesis. The temperature was normal.

*Physical Examination.* I first saw the child midway in the third day. Neither the skin surfaces nor the visible mucous membranes were noticeably pale. There was no blood on the pharyngeal wall. The head was slightly retracted but there was no real rigidity of the neck. The thighs were held flexed on the abdomen and the hands were tightly clenched. The abdomen was moderately distended. The sphincter ani was relaxed and a moderate prolapse of the rectum was



present from which mucus, tiny blood clots and semi-fluid meconium trickled. The child's facial expression, in fact his whole attitude, was one which unmistakably recorded an awareness of distress. Aside from the impression gained by observation, physical findings were entirely negative.

*Laboratory Data.* Third day the blood count showed hemoglobin 16.8 gm. per 100 c.c.; erythrocytes 4,400,000; leukocytes 12,600; coagulation time  $3\frac{1}{2}$  minutes; bleeding time 3 minutes. On the fourth day erythrocytes were 4,600,000, leukocytes 22,500, and on the fifth day, erythrocytes 4,500,000. A culture of the stools taken on the third day showed only bacillus coli after forty-eight hours of growth.

*Management and Progress.* Immediately following the physical examination 20 c.c. of whole blood were injected intramuscularly. Six hours later, and again in twelve hours, 10 c.c. of blood serum were given intramuscularly. Breast milk feedings were stopped and the mother's milk supply was maintained by expression.

Beginning the latter half of the third day the infant was fed one ounce of a mixture of five tablespoonfuls of raw macerated apple pulp in 9 ounces of weak tea every 2 hours for 24 hours. During the next 24 hours 2 ounces of a mixture of 7 tablespoonfuls of apple in sufficient tea to make 24 ounces were fed every 2 hours. On the fifth day the apple content was increased to 9 tablespoonfuls, and 5% beta lactose was added. Three ounces of this mixture were given every 3 hours. Throughout the sixth day alternate feedings of raw apple and of expressed breast milk were given every 3 hours, and on the seventh day only breast milk.

There were twenty semifluid stools during the third day, all of which were streaked with blood and many of which, during the latter part of the day, contained mucus. Convulsive twitching recurred frequently. The temperature was slightly subnormal. During the second 24-hour period (fourth day) soft stools were passed at intervals of about 3 hours. The amount of visible blood had decreased and there was little mucus. The temperature was normal and there was no convulsive twitching. Signs of tenesmus were no longer apparent. Only small stains of blood and a few clots appeared on the surface of the five bowel evacuations during the next 24 hours. And on the sixth day (after 72 hours of apple feeding) there were only four stools, none of which contained visible blood.

The child weighed 3350 grams on the third day; 3250 grams after 72 hours; and 3520 grams on the tenth day when he was discharged from the hospital.

*Comment.* The sequence of symptoms and clinical course in this case closely followed repetitious descriptions of symptomatic melena vera. Particularly diagnostic was the initial sign of hemorrhage and its dominance of the clinical picture during the first twelve hours. There were no prodromal symptoms preceding hemorrhage. Insignificant change in the number of erythrocytes following the first blood count is sufficient

reason for assuming that hemorrhage in this patient was not adversely affected by the method of feeding. On the other hand, there is insufficient reason for assuming that the period of hemorrhage was shortened since hemorrhage, in those cases of melena which recover, may be expected to stop spontaneously, usually between the second and fifth days.

That diarrhea was a more alarming factor than hemorrhage became evident after the second red blood cell count, but there was encouragement as well as surprise in the pure culture of bacillus coli.

It is difficult to account for the loss of only 100 grams in body weight during 72 hours of apple feeding unless one assumes that, besides the absorbent and detoxifying properties generally attributed to it, apple pulp possesses the additional property of promoting retention of fluids. No other explanation seems justified in this case. Actually, since there are 9.5 calories in one tablespoonful of apple, the infant received only 47.5 calories during the first 24 hours; 67.5 calories in the second 24 hours, and with the addition of 5% lactose, 229.5 calories during the third day. And yet, despite the fact that diarrhea was severe, there was negligible loss of weight and no appreciable decrease of tissue turgor.

It may be arguable that in this case apple feeding should have been replaced by breast milk when, after two days, even though the stools were still quite soft, the frequency had decreased from twenty to eight in 24 hours. Or it may be maintained that recovery would have been more prompt if, from the start, a larger quantity of apple had been given. But precedent provided no rules for the new-born period. My own observations and the recorded experience of others have shown that the digestive capacity of infants just beyond the new-born age and of older children permits the feeding of 2 or 3 tablespoonfuls of apple pulp every three hours, and it was interesting and instructive to observe that in the case reported here the infant eagerly took all that was offered and cried for more.

As indicated in the prefatory remarks, most clinical reports which deal with the subject of apple feeding are concerned with the effectiveness of this therapeutic measure. Much is said about prompt and sometimes dramatic response but very little, in the way of positive informa-

tion, about the action, individually or collectively, of pectin and cellulose, of tannic acid and of malic acid, all ingredients of apple pulp. And although the evidence at present points strongly toward pectin, because of its primary colloidal and buffer property, as the most important principle in apple pulp, the fact must not be overlooked that the dietetic method is new and unfamiliar and that further study may uncover and identify other therapeutically active principles and explain their action. Meanwhile, it appears that there is sufficient therapeutic value in the method to warrant more general clinical trial.

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#### LAWRENCE-MOON-BIEDL SYNDROME

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In 1886 Lawrence and Moon<sup>1</sup> first described a syndrome in which the cardinal characteristics of the symptom complex were obesity, genital dystrophy, retinitis pigmentosa, mental deficiency and polydactylism. Because of the original description of Lawrence and Moon and the elaboration as a distinct obesity syndrome by Biedl<sup>2</sup> the name Lawrence-Moon-Biedl syndrome has been suggested for the condition.

The familial incidence of the disease suggests that it is a hereditary disorder. Solis-Cohen and

Weiss<sup>3</sup> in 1925 reported four children in one family who exhibited marked adiposity with mental deficiency, genital dystrophy and diminution of vision due to retinitis pigmentosa. Polydactylism was present in two. Weiss<sup>4</sup> later reported two cases in sisters who showed in addition to the previously mentioned symptoms nerve deafness. Boenheim<sup>5</sup> mentioned deafness as a cardinal symptom of the syndrome. Reilly and Lisser<sup>6</sup> in 1932 reviewed all the reported cases in the literature, seventy-three in all at that time. Of these twenty-five showed the complete syndrome and a number of cases were doubtful. Since publication of their paper several other cases have been reported.

The fat distribution in most instances has been of the Froehlich type, and the genitals are hypoplastic. Varying degrees of mental deficiency have occurred. A peculiar appearance of the eyes and the complaint of night blindness are common. Polydactylism and deafness are not constant findings but one or both symptoms are present in a majority of the reported cases. The following case appears to be a member of this rather unusual group.

#### REPORT OF A CASE

R. W., a white boy, aged 11 years, came to the Clinic August 22, 1936. There was a history of obesity, genital hypoplasia, deafness and night blindness.

Family history: The patient was the youngest of three children. The father and mother were born in the United States and there was no history of consanguinity in the family to their knowledge. They were large individuals and both were in good health. There was no history of mental deficiency, night blindness, deafness, polydactylism or syndactylism in the family. The father's family tended to be obese.

The patient was the product of the fifth pregnancy. The second and fourth pregnancies had terminated at term with still-born babies. An older sister and brother were alive and well.

Birth and development: The patient was born at term, was delivered normally and weighed 10½ pounds. The first tooth erupted at three months, he talked at 15 months and walked at 20 months. He was apparently perfectly well until two years of age. At that time he fell 14 feet from a second story window following which he was unconscious for one hour. For three weeks afterward he complained of pains in the head and then again was apparently perfectly well. About six months after the fall deafness and disturbance of speech were noted and the deafness became progressively more marked for a time. At four years of age his mother noted the obesity and at the age of ten years night blindness became manifest. The obesity was more marked as he grew older and no improve-



ment in speech had been noted since he was eight years of age.

He had never gone to school but with concentrated tutelage had learned to write his name and a few other words. He was clean in his habits, of a good disposition and obedient. There was no behavior disturbance.

He had had measles and pertussis, both in mild form. At the age of five years he had undergone tonsillectomy and dilatation of the eustachian tubes because of the

was 86 pounds (39 Kg.). The temperature and pulse rates were normal. The blood pressure was 110 systolic and 70 diastolic. The salient findings in the physical examination were obesity of the Froehlich type, genital hypoplasia, deafness and badly pronated, flat feet. There was no polydactylism or syndactylism. His speech was guttural and inarticulate and he was totally deaf.

The eyes were examined by Dr. G. L. Porter. It was impossible to obtain the visual acuity but the poor vision caused no difficulty in the daytime. The external appearance of the eyes was normal, pupils regular, equal and reacted to light and in accommodation. It was impossible to obtain even a gross visual field estimation. Ophthalmoscopic examination revealed the following: there were a few vitreous opacities, both discs showed a mild pallor without loss of substance. The retinal arteries were markedly reduced in calibre without evidence of sclerosis. The periphery of the retina showed the bone-corpusele type of pigmentation typical in retinitis pigmentosa. There was moderate choroidal degeneration. In each macula there was an area of cystic degeneration with a formation of a hole about  $2/3$ 's disc diameter in size through which the reddish brown underlying choroid was plainly visible. The eyes were hyperopic about  $3\frac{1}{2}$  diopters.

The basal metabolic rate was  $-10\%$  (Benedict standard). The blood sugar was 87 mg. per one hundred cubic centimeters of plasma; the result of the glucose tolerance test was negative. The blood Wassermann and Kahn tests were negative. Urinalysis was negative and the complete blood count was within normal limits. A Mantoux test with 1/10 mg. of old tuberculin was negative.

Roentgenograms of the head showed a turret shaped skull; the sella turcica appeared normal. Roentgenograms of the chest were negative. The wrists showed a normal number of ossification centers.

The occipitofrontal circumference of the skull was 55.5 cm., the span of the arms 153 cm.; the circumference of the abdomen at the level of the umbilicus 90.5 cm. and the circumference of the chest at the nipple line 94 cm.

Psychometric studies were done by Dr. Harold Anderson from the department of Psychology at the University of Illinois. He made the following report: The mother reports this patient is sensitive to vibrations. He probably does some lip reading as the mother frequently communicates with him in sounds scarcely above a whisper. He has had no systematic training in lip reading and not much help in the development of concepts. Only a limited number of tests were available but the general impression in watching the boy's struggle to understand his mother's directions and his performance is that he is mentally retarded but has abilities that could be considerably developed by adequate training.

Due to the small number of tests given in the Binet-Simon series it was impossible to compute a mental age. There was found no evidence of mental retardation which could not be accounted for by his auditory handicap.



KEY TO ILLUSTRATION

Figure 1.: Taken three months after institution of weight reduction. Weight at this time was 149 pounds (67.9 Kg.). Note hypogenitalism and Froehlich type of fat distribution.

deafness. There was no history of polyuria or polydipsia.

Examination: The patient was an obese boy of normal height for his age. His weight was 176 pounds (80 Kg.). Average weight for his age and height

On the Thurston Hand test he made a score ranking at the 60th percentile of norms based on the record of 238 male engineering students in college.

With the Healy-Bronner Learning Z test he scored 28, placing him at the 40th percentile of norms for ages 8 to 12. He was given three consecutive trials with scores 5, 10 and 13 respectively. The progress of scores is evidence of learning ability.

He was put on a 1000 calorie weight reduction diet and a corrective shoe was advised. He was given 1 c.c. of anterior pituitary extract twice weekly for two months. A definite enlargement of the testicles occurred but no change was noted in the penis at the end of this period. After three months on the diet, his weight was reduced from 176 pounds (80 Kg.) to 149 pounds (67.7 Kg.). He was considerably more active and subjectively less tired after exertion. On January 14, 1937, his weight was 135 pounds (51 Kg.) and the stringent reduction regime was modified. At the present time plans are being formulated to give the patient institutional training for the speech difficulty.

*Comment.*—Numerous theories have been advanced as to the causes of the Lawrence-Moon-Biedl syndrome. Raab<sup>7</sup> suggested that a high and massive dorsum sella in these patients caused interference with the flow of an energizing secretion from the pars intermedia of the pituitary gland through the stalk of the infundibulum to certain metabolic and genito tropic centers at the floor of the midbrain. The objection to this theory is that most cases of the fully developed syndrome show an absence of high and massive dorsum sella.

Ornstein<sup>8</sup> holds a genetic defect of the prosencephalon (forebrain) is responsible for adiposogenital dystrophy, retinitis pigmentosa and mental deficiency and that skull deformities, polydactylism, atresia ani and other occasional anomalies are present only through the coupling of somatic genotypic unit characters. Jenkins and Poncher<sup>9</sup> feel Ornstein's theory furnishes a working hypothesis for the occurrence of adiposogenital dystrophy, the mental deficiency and retinitis pigmentosa but does not offer an adequate explanation for the polydactylism or any of the other defects occasionally associated with the syndrome. They presented a hypothesis based on known facts of mendelian heredity, as it occurs in lower forms of life, presuming such processes undoubtedly occur in man in the same way. They suggest that the syndrome is due to the linkage of two or more genes bearing unit character. These genes cannot carry simple dominants; they may bear simple recessives.

#### SUMMARY

A case of Lawrence-Moon-Biedl syndrome is

presented. The various theories as to pathogenesis of this unusual condition are briefly discussed. Therapeutic measures except from the standpoint of weight reduction are apparently without promise at the present.

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#### FURTHER STUDIES WITH ZINC IONIZATION IN THE TREATMENT OF TRACHOMA

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Three years ago I began treating cases of trachoma in all clinical stages with zinc ionization of the conjunctiva, which<sup>1</sup> I reported last December. Since then, I have had ample opportunity to observe the results of some of the cases treated; and, through the suggestions of some of my colleagues who have carried on zinc ionization in trachoma with my method and electrodes independently, the technique and electrodes were improved. So, I am glad of the opportunity to report this second series of cases which have been observed by others as well as by myself.

A. F. MacCallan<sup>2</sup> laments the fact that there has been no advancement in the method of treatment of trachoma during the last thirty years. I may state that there has been little improvement in our modern procedures from those in vogue by the ancients. They used practically the same medical and surgical methods that are being used today in the treatment of trachoma, and while the disease at present is not epidemic, it still remains as an endemic disease in many lands. It is most frequent in Arabia and Palestine, is endemic in Syria, Persia, Central Asia, China and Japan. It is very prevalent in most eastern European Countries, especially

<sup>1</sup>Read at the Fifteenth Annual Session of the American Congress of Physical Therapy, New York City, February 8, 1937.



in Galliopoli, Poland, Lithuania, Russia, Hungary and certain districts in Germany.

In the United States it is found, with severe and destructive manifestations, in Southern Illinois, in the mountainous regions of Kentucky, West Virginia, Missouri and Tennessee. Mossman<sup>3</sup> states that in 1913-1914 it was estimated by John McMullen that there were 33,000 cases of trachoma in the 35 mountain counties of Kentucky, and that in Missouri 20% of the blind pensioners were end-results of trachoma. The latest figures (July 7, 1927) show a total of 3152 pensioners, and of those, 637 or 20.2% were blind from trachoma. In Oklahoma, Arkansas, Texas, Arizona, and New Mexico, trachoma is very prevalent. Among the Indians of our country, based on a population of 194,824, seventeen per cent were found to have trachoma in 1911, according to the annual report of the Commissioner of Indian affairs for that year. The Eskimos are susceptible to trachoma, and small endemic foci are found among them.

**Etiology.** With reference to the etiology of the disease, one is amazed, on referring to the literature, at the extent of the investigation and experimental work which has been carried on to date. Howard,<sup>4</sup> in his summary on "Results of Recent Investigations in the Etiology of Trachoma," evaluates and divides the alleged factors into five groups:

1. **Inclusion—Bodies:** Certain investigators believe that the inclusions of trachoma and other diseases are morphologically alike but that they may be biologically different. Animal experimentation has thus far failed to solve this problem. Although etiologic significance is disputed, the diagnostic value of inclusion-bodies remains "almost undoubted." Other workers who have artificially induced conjunctivitis in animals, conclude that the presence or absence of inclusion-bodies would appear to be of no importance in the etiology or diagnosis of trachoma.

2. **Nutritional and Constitutional Aspects:** The status of either of the following remains uncertain; Vitamin A or B deficiency, lymphadenoid diatheses, digestive disturbances in infants or a chronic evolution in a lymphatic constitution.

3. **Bacteriology:** There is not sufficient proof that the *Bacillus granulosis* of Noguchi, or any of a number of other bacteria advanced by other investigators, are responsible.

4. **Filtrability:** There is no evidence to support the following: that the etiologic agent is a filtrable virus; that the agents concerned are virus plus secondary invading bacteria. Studies of Julianelle and Harrison<sup>5</sup> indicate that the infectious agent of trachoma is not readily filtrable. Thygeson<sup>6</sup> in his recent work on filtrability of trachoma virus is convinced that he has demonstrated the causative agent. Kuttner and Shao<sup>7</sup> believe that inclusion-bodies may be due to a filtrable virus of low virulence or to other agents.

5. **Allergy:** Experiments of Julianelle and Morris<sup>8</sup> are "highly suggestive": that trachoma may be due to a purely allergic condition.

From the above deductions one can readily see that at present little is known concerning the mode of propagation of trachoma; that poverty, undernutrition, squalor, prolonged contact with a trachoma sufferer, unhygienic and crowded modes of living, seem to be the only common circumstances wherever trachoma exists, be it in Egypt, Southern Illinois, Arabia, India or Hungary; although occasionally a sporadic case occurs among the well-to-do and well nourished individuals with no history of a contact.

Stucky,<sup>9</sup> in 1913, who has made a thorough investigation of the situation of trachoma in Eastern Kentucky, has advocated and obtained the assistance and coöperation of the state and federal government to combat it, and aside from prophylaxis and some preventive measures, not much progress has been made since. In this connection may I call your attention to the condition existing in my own state. It is estimated there are 7000 cases of trachoma in the hill counties of southern Illinois among native Americans. A clinic was established in 1934, designated the "Governor Horner Trachoma Clinic," and has been operating since.<sup>10</sup> From that period to March, 1936, a total of 971 cases (or 1866 eyes) were treated; the total number of treatments given was 12092, some patients receiving as many as 115 treatments. The results as officially summarized are as follows:

Vision before Treatment		After Treatment
20/20 .....	565	5% lost vision
20/40 .....	293	10% improved to 20/50 or better
20/60 .....	118	
20/100 .....	291	7% improved to 20/200
20/200 .....	143	
Under 20/200 .....	375	
No vision recorded.....	45	
Amaurosis .....	36	
Total, eyes .....	1866	

Only 82 cases out of 971 showed improvement in vision, and the improvement was only up to 20/50 and 20/200, while 25 cases lost vision despite treatment. The 82 cases which improved slightly had fair vision before treatment. The negligible results which were obtained at a tremendous cost to the state are worthy of mention here.

The cost of each treatment was tremendous; some of the money was appropriated by the State of Illinois, by the federal government, by the Illinois Society for the Prevention of blindness, and by the individual counties.

I believe that the socialization and regimentation of the treatment of trachoma by political appointees as against the competent local physicians who are well experienced with the groups, types, families and individual patients, and who have a great deal of knowledge, experience and information in the treatment of this dread disease, is a grave error, and is another demonstration as to what state medicine in general will do in the future. The local doctors could and would handle the situation at a fraction of the present cost with far better results. Furthermore, research work and investigation has been entirely neglected and even discouraged.

If the state, the federal government, organized charities and local counties are willing to spend vast sums of money, those sums should be expended in a manner so as to accomplish the most good. Now patients are transported 40-60 miles to a courthouse, public library or other public building obviously intended as a political show. This money should be spent with the local physicians who are capable of handling the situation, from whose hands the trachoma problem has unjustly been removed by state medicine.

Surgeon General Parran, of the U. S. Public Health Service, offers a remedy in the following words: "I am convinced an integrated plan of public health, public medical service and private practice is preferable to State medicine, as their proponents refer to it. Under the combination I favor, the doctor would retain everything now satisfactory to himself and his compensation for the present unbearable load of free service; there would be no disruption in the physician-patient relationship for the large sector of medical practice in the home and in the doctor's office."

*Pathology.* The pathology of trachoma, unlike its etiology, is so well known and has been worked out so thoroughly that in a report of this nature only the definition is necessary. Trachoma is defined as a specific infective disease<sup>11</sup> of the subepithelial tissue of the conjunctiva characterized by infiltration and the formation of lymphoid follicles, which necrose. In the later stages of the disease there is a formation of fibrous tissue of variable amount; it may be so extensive as to cause obliteration of the conjunctival sac.

The disease, beginning in either the upper or lower fornix, appears first in the form of gelatinous-looking round swellings or follicles, which become confluent, and then resemble grains of boiled sago or frog-spawn. When large, these follicles easily rupture and their gelatinous content is extruded. The first sign of the disease in the tarsal conjunctiva is in the form of small, circular, pale-grey areas due to follicles embedded in the fibrous tissue; later, these enlarge and form elevations on the surface which, like the follicles in the fornices, may rupture. Clinically, trachoma is classified either as papillary, follicular mixed, or cicatricial. In some cases, where a fibrous band of tissue is formed around the sulcus subtarsalis, it is termed *Artt's streak*; in others, there is a hyaline degeneration which gives it the appearance of a brawny edema (Stelwag's). The complications, sequella or end-results of trachoma need not be mentioned here.

*Diagnosis.* This series of cases which I am reporting have resisted treatment longer than a year and there has been no question about the diagnosis. Most of them have been treated at clinics, with an established diagnosis of trachoma, with the usual methods of application of astringents, mild caustics, massage, expression and irrigation; some have had operative procedures on the lids. Some have cleared up for a time, only to have an acute exacerbation with symptoms beginning all over again and complications following. In many of them some scar tissue in the tarsal conjunctiva was present with pannus, and a few had considerable scarring of the cornea from ulcers. Thickening of the lids and some degree of ptosis were present in nearly all of the cases. It seems as though every case of trachoma in this series was a law unto itself and no formulated treatment was applicable to all of them, and when zinc ionization was started,



the cases represented almost any clinical variety with most of the complications and sequellae common in trachoma, even trichiasis and entropion. The most striking observations by all of us who applied zinc ionization was the absorption of the follicles, thinning of the lids and the smooth and thin resulting cicatrices.

Some of these results were observed as early as three weeks after the initial application of zinc ionization. Where there was pannus the condition began to improve from the first treatment on. Borderline cases and those of doubtful diagnosis were not treated in this series.

*Method of Application.* Butyn anesthesia is used. With the patient in the recumbent position, the negative pole is connected to a pad (saturated with normal salt-solution) affixed to the patient's arm or back. The positive pole is

the insulation is intact on the posterior or corneal surface of the electrode as well as on its margins. Exposure of the metallic zinc causes cauterization and sloughing.

#### CASE REPORTS

Of the 53 cases previously reported,<sup>1</sup> I was able to follow 21 patients which have been discharged from the clinics as arrested cases and who have received no active treatment since discharge, as follows:

7 cases no recrudescence	29 months
4 cases no recrudescence	24 months
4 cases no recrudescence	19 months
6 cases no recrudescence	11 months

None of the above mentioned patients have had any symptoms whatsoever and the disease to date remains arrested.

This represents 62% of the cases which I was able to follow, out of the 34 which were discharged as arrested in the original series of 53.

In this series of 72 cases, which we began treating in August, 1935, the treatments were given at two,

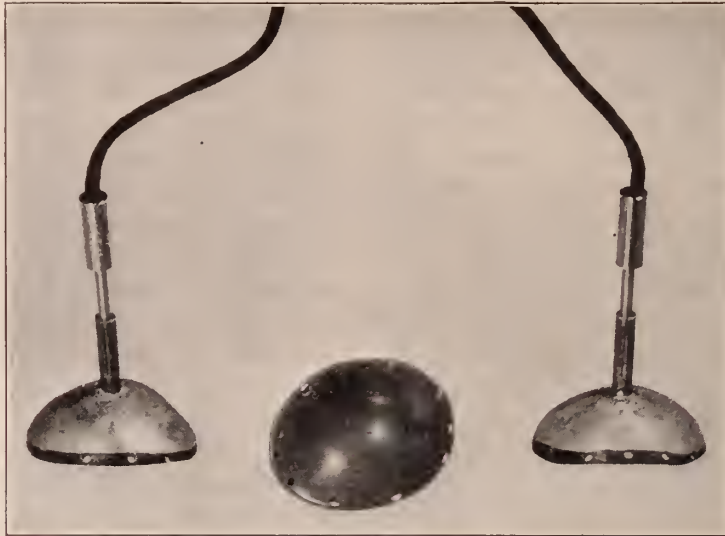


FIG. 1. Electrode

connected to the eye electrode, previously saturated with a 2% zinc sulphate solution, and inserted under the lids. A current of about 5 to 7 ma., from a galvanic apparatus, capable of delivering at least 10 ma., is turned on gradually for ten minutes. After removal of the eye-electrodes, the fornices are thoroughly irrigated with saline solution, as there is a considerable amount of zinc chloride solution mixed with the lachrymal fluid, which is quite irritating. On inspection of the conjunctiva one sees a grayish yellow film which is firmly attached wherever the electrode was in contact. The film remains for about three to nine days deeply imbedded in the conjunctival subepithelial tissues. Care must be taken that

three and four weekly intervals. We waited until all active symptoms and reactions disappeared before administering the next zinc ionization, and no more than four treatments were administered to any eye. The following are the results so far.

In 11 cases the disease was arrested after two treatments were given at two week intervals, and have been discharged and no active treatment given since December, 1935.

Nineteen cases were given three treatments each, 12 at two weekly intervals each and 7 at three weekly intervals each. Their course of treatment ended March of this year, and they have received no further active treatment since then and no signs of relapses or recrudescence has been noted.

Fourteen cases received one treatment each and refused further zinc ionization; 8 of these were subsequently treated for a period of ten weeks with chal-

moogra oil massage and mercury oxycyanide irrigation, and were discharged as arrested in May of this year. The other 6 did not return for further treatment.

Ten cases did not respond to the treatment over a period of thirteen months. Some received one, two and three treatments.

Nineteen cases are being treated now, of which some are showing definite regression with amelioration of symptoms and notable improvement in follicle and lid conditions.

*Reactions from Treatments.* No severe reactions or complications were noted in any of the patients treated. Moderate edema of the lids and engorgement of the conjunctiva were present in all of them, which lasted from about five to fourteen days. The film or membrane which appeared in most of the cases on the conjunctiva where the electrode was in contact, usually disappeared in about ten days.

#### SUMMARY AND CONCLUSIONS

1. All cases had previously resisted many forms of accepted treatment for a year or longer, and zinc ionization resulted in arrest of the disease after one or more treatments, excepting in 7% of the cases which did not respond.

2. No complications or sequelae resulted in any of the patients treated, and only edema of the lids and engorgement of the conjunctivae were noticeable.

3. Follicles disappeared rapidly and cicatrices when present became thinner and smoother in most cases.

4. Thickening of the lids and ptosis were noticeably reduced in all cases.

5. The favorable results were noticed early, even after one zinc ionization treatment.

6. Improvement in vision was noticed from 1/10 to 3/10 in 21% of the cases treated.

7. No recrudescence occurred in

7 cases after 29 months

4 cases after 24 months

4 cases after 19 months

6 cases after 11 months

11 cases after 8 months

19 cases after 6 months

Total percentage discharged as arrested in both series was about 41%.

8. Cases which resisted routine treatment for a year or longer, who received one zinc ionization treatment and who refused further ionization, and who were subsequently treated routinely, were discharged in ten weeks as arrested without any further active treatment and remained quiescent.

9. Amelioration of all subjective symptoms with notable beginning regression of follicles was

obtained in 24% of all cases treated after only one treatment.

10. Zinc ionization was employed in acute and chronic cases of trachoma and in the presence of corneal ulcers and pannus.

11. No expensive equipment or apparatus is required. Any galvanic current generated by dry or wet cells, a battery or street current fitted with a rheostat and milliamperemeter is suitable.

185 N. Wabash Avenue.

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#### DISCUSSION

Dr. O. B. Nugent of Chicago: I have seen Dr. Edison's work with zinc ionization in trachoma at the Illinois Charitable Eye and Ear Infirmary and will confirm his statement of results. Many of the cases which were shown eight and nine months after the final treatments showed complete healing with very smooth conjunctival scars and few, if any, had remaining pannus.

I have not used this method myself and the only experience I had with physical therapy referring to trachoma was with cauterization of vessels around a pannus which resulted in complete absorption. Dr. Edison should be congratulated on his work and I believe that some of us should follow his technique as it opens a new avenue in the therapeutics of trachoma.

Dr. Gustav Erlanger of New York: For the past 17 years I have been working with ionization of the eyes generally. I have seen many cases of trachoma and can say that I confirm all that the essayist has said. There is no doubt in my mind that as far as the cornea is concerned that ulcers and pannus disappear more rapidly under Dr. Edison's form of treatment. I have used calcium with zinc in mild solutions preceded by adrenalin and there was practically no irritation or reactions following the treatment. Of course



the irritation and reactions are variable with different cases but I find that by stimulating the sympathetic system that I get better ionization. It produces not merely a passing hyperemia but an active one.

I remember one particular case of trachoma which I treated with ionization in a patient who had a large ulcer of the cornea and in which all other methods failed to clear it up. I treated the patient with ionization of zinc and calcium and after the second treatment the ulcer shrank and in eight days it practically disappeared and the conjunctiva looked fairly normal. I can earnestly recommend the use of Dr. Edison's method but I think that the voltage should be reduced and also the concentrations of the solutions. A 0.5% of zinc sulphate with 1% of calcium chloride is a more satisfactory solution.

Mimmi of Japan recommends the use of a 25% solution of calcium chloride for ionization and reported excellent results, but I have tried it and the reactions were too great.

I believe that zinc ionization in the treatment of trachoma as used by Dr. Edison is so effective because of the infiltrations of the drugs into the conjunctiva and cornea and into the masses of cells. The infiltration of the drugs is more lasting and more effective than even subconjunctival injections.

Dr. H. M. Cottle (Chicago): I have seen many of Dr. Edison's patients in his clinic and on many occasions have witnessed him carry out the treatment at the infirmary and can substantiate all that he has said. About seven years ago I started the use of diathermy in the treatment of trachoma, especially when there was pannus present. In 1931 in the *Journal A. M. A.* a report from Armenia was printed regarding the use of diathermy and coagulation of the lids in the treatment of trachoma. Since that time I had occasion to use it. I am referring to the pannus of trachoma which yielded very readily to the diathermy treatment as reported in the *Journal* and by myself.

Some of my cases are now seven years and five years old with no recurrences. Dr. Nugent has also used the method for several years. I think he reported on them before one of the sessions of this Society, a year or two ago.

To those of you who are doing that work, I recommend that, in addition perhaps as a supplement to the work of Dr. Edison.

The question of anesthesia is very important. After-pain must be taken into consideration, but after that it is remarkable just what occurs. Large ulcers of the cornea and follicles disappear.

Dr. Edison (Closing): I wish to thank the discussers of this paper and I am gratified to learn that they too have had results similar to those which I reported. Since my preliminary report I have been in communication with some men in this country, Europe and Asia, who have carried out this form of treatment, and it is very encouraging indeed. Dr. Erlanger's remarks are well taken. I have tried milder solutions of zinc and also combined them with calcium. I have used all the way from 3 to 12 milliamperes in different cases and I can assure him that there are no severe

reactions up to 10 milliamperes with exposure of from 5 to 10 minutes with a 1% zinc sulphate solution, and the calcium does not seem to make much difference.

Dr. Cottle's remarks pertain to surgical diathermy and coagulation of the follicles and using diathermy to cut off blood vessels from around a pannus and his work is well known and recognized, but has no particular bearing on the zinc ionization of the conjunctiva as I have used it, and which my present report consists of. After the trachomatous conjunctiva is quieted, then surgical diathermy to pannus or ulcers of the cornea is indicated, but per se it does not influence trachoma. Many methods of coagulation and cautery have been used on the conjunctiva in trachoma but as far as I know this method of zinc ionization as described by me is different and I believe very effective.

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## CESAREAN SECTION

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Rarely a day or night passes without physicians aiding womankind in an obstetrical capacity. Some time your initial meeting with the patient is at the delivery but fortunately more women are learning the advantages in adequate prenatal care.

The vast majority of cases are uncomplicated and deliver through the birth canal. However, a few because of disproportion or other pathology cannot be terminated successfully except by the abdominal route.

Improved technic in performing cesarean section is probably one of the main reasons for the increased frequency of the operation today. This subject has been thoroughly presented in the literature recently by Dr. Stander and others. For the present I wish to focus your attention on the technic which has met with great favor on a large obstetrical service during the last year and a half, namely the so-called "Transverse Incision of the Lower Uterine Segment."

The chief advocate of this type of incision is Phaneuf; however the procedure was suggested some fifteen years ago by Munro Kerr.

The following is a brief case which illustrates the topic of our discussion:

F. H. is a 21 year old primipara routinely followed for 5 months preceding hospital entry 6 days before term date. Her history was irrelevant and general physical examination without note. From the obstetrical point of view she was considered an elective sec-

tion because of a generally contracted pelvis, that is to say the diagonal conjugate measured 9 cm and tubers measured 7 cm with presenting part floating freely. Blood pressure, urine and Wassermann were normal. During the 3 days period of hospital observation she received a daily vaginal instillation of acraflavin 1% in

placed. There was no extension of the uterine incision and it was closed with one layer of interrupted sutures and a layer of continuous. The suture used was 2:20 day. The bladder peritoneum was then sutured over the uterine incision and the abdomen closed in routine manner. The packing was removed the fol-

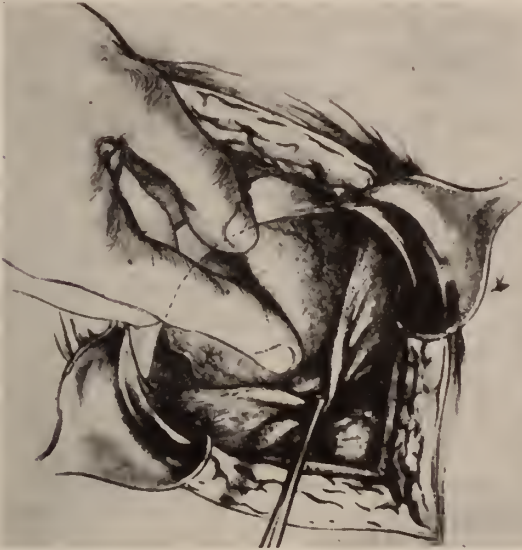


Fig. 1. Abdomen opened and bladder peritoneum being reflected down.



Fig. 2. Transverse incision in uterus with chin anterior for extraction.



Fig. 3. Uterus closed with one row of interrupted and one row of continuous sutures.

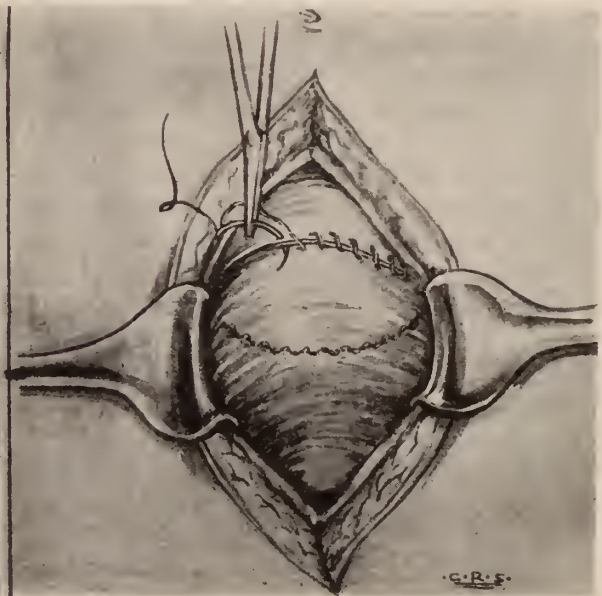


Fig. 4. Note closed uterine incision beneath bladder flap which is now being closed.

glycerin. Under morphine scopolamine seminarcosis and 1% novocaine local infiltration the abdomen was opened; bladder peritoneum reflected down and a transverse incision was made in the uterus just below the junction of the upper and lower uterine segments. A 3000 gram living female child delivered; placenta removed and the DeLee's shuttle with intrauterine pack

lowering day and the postoperative course was uneventful. Patient and baby were discharged on the 13th postoperative day. Her course after leaving the hospital was entirely normal.

She again presented herself some eleven months later for an initial visit with her second pregnancy. As in the first pregnancy the prenatal course was entirely



normal. On July 16 of this year she was hospitalized for a second elective section. This operation was carried out in the same routine manner as discussed in the first except sodium amytal with hyosine constituted the semimarcosis and gas ether mixture for the anesthetic.

Careful inspection of the intraabdominal operative field failed to reveal any evidence of the previous cesarean scar. There were no additional difficulties in the operative procedure as for a retraction of bladder peritoneum and etc. A 3100 gram living male child was obtained at this operation and again she had a very uneventful postoperative course.

This technic has not only proved satisfactory from the standpoint of decreased blood loss, decreased incidents of infection but in addition as we have noted in this case it has given very satisfactory healing—so perfect that in 16 months there was no gross evidence of a previous incision of a lower uterine segment.

At this point I would like to mention another advantage of the lower transverse incision; namely, cesarean section followed by sterilization. After the child is delivered it is a very easy matter to clamp and cut the broad ligaments and continue the uterine incision posteriorly thereby performing a supravaginal hysterectomy. The advantages of this simplification are of course quite obvious to you.

In conclusion we must all agree that cesarean section in general is abused and the high mortality rate unnecessary. If the proper technic is employed under the proper conditions cesarean sections in this country as elsewhere should be a real life saving procedure and not a contributor to maternal mortality as it is today.

Spivey Bldg.

## PRENATAL SYPHILIS A PREVENTABLE DISEASE

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CHICAGO

Syphilis acquired before birth is known as prenatal (congenital) syphilis. This form of syphilis is a contact infection transmitted to the child by the mother. This transmission takes place from the mother to the fetus about the fourth month of pregnancy. The transmission is from the maternal circulation by means of the placenta. This means that it is necessary for a

spirochetemia to be present in the maternal circulation. Such a state exists in early syphilis and if conception occurs during this period of the maternal infection, the conditions are ideal for placental infection. Pregnancy occurring during late syphilis may or may not terminate with fetal infection.

The entire problem of syphilis is now receiving national and state governmental consideration. It deserves recognition, because of the great toll it exacts in every phase of our national life. Measures for the control of this plague are now in preparation in our own state. But while it may take a decade or longer before we can diminish the incidence of early syphilis, the prevention of prenatal syphilis can be easily accomplished *now*.

The prevention of prenatal syphilis is simple and under favorable conditions almost certain. In order to prevent prenatal syphilis with all its immeasurable disasters, personal and social, it is necessary for the medical profession and those individuals interested in public health work to attempt the colossal task of educating the public to know that every expectant mother, regardless of wealth or social status, should report to her physician or clinic early in pregnancy; that she should have a thorough physical examination including serological tests (Wassermann and Kahn or other similar precipitation tests, Kline, Hinton, etc.) and if any evidence of syphilitic infection, clinical or serological, be found, she should have adequate treatment. When these methods are applied to all cases of syphilis in pregnancy, then will prenatal syphilis cease to exist among us.

It must be realized that the diagnosis of syphilis in pregnancy is usually impossible without the aid of a blood test. Syphilis in pregnancy is commonly without clinical manifestations. Information from patients with regard to previous infection is often misleading or even intentionally false, and moreover women are frequently (more than 50%) unaware of infection, since the primary lesion is often hidden from view. It is this knowledge that we cannot depend on clinical manifestations alone to diagnose syphilis in women that should make a routine serological examination of each and every pregnant woman a procedure which should be as much a part of medical practice as the taking of the patient's name.

From the Ehrlich Clinic of the Chicago Maternity Center.

It is a matter of surprise to the syphilologist that the obstetricians who are so convinced of the value of routine Wassermann examinations and antisyphilitic treatment when necessary in clinic practice, are averse to applying the same procedure in private practice. The objection often advanced that the private patient, the average well-bred woman, will be insulted at the mention of syphilis, is a time-worn relic of the unfortunate mixing of morals and medicine. The obvious answers to this objection are: First, that there is no station in life, no amount of culture, blue blood, or education which protects any individual against syphilis. The bishop brought into contact with the spirochete is as liable to infection as the negro laborer; the debutante as susceptible as the wife of a taxi driver. Second, there is no necessity whatever for explaining to a patient that one desires to test the blood for the presence or absence of syphilis, any more than one explains in detail the rationale of urine testing, blood count, blood sugar determination, etc. We are often asked: Is the Wassermann test reliable during pregnancy? Stillians,<sup>1</sup> who studied this question thoroughly, concludes that the Wassermann reaction has almost the same diagnostic value in the pregnant as in the non-pregnant woman.

Kilduffe<sup>2</sup> says: "False positive reactions do not occur in the maternal serum in any greater proportion than is common to the method used in performing the test." Our procedure is to divide our patients into serologically negative, serologically positive and serologically doubtful. Those who on two or three successive examinations have a 4-plus Wassermann and Kahn, or a 3-plus Wassermann and Kahn are considered definitely syphilitic. Those patients who on two or three successive examinations have readings as Wassermann 2 plus, Kahn negative, or Wassermann and Kahn 1 plus, or Wassermann negative, Kahn 2 plus, are submitted to further study. These patients are questioned closely about previous pregnancies, about premature births and miscarriages, the other members of the family are examined, especially the husband and the previously born children; and the blood tests are repeated at suitable intervals following a provocative test, or, following the use of potassium iodide. Furthermore, these patients are observed closely for a period of months. In no case is treatment instituted until a definite diagnosis is

established. A negative test on suspicious cases is repeated at suitable intervals.

These briefly are the principles upon which we conduct our Luetic clinic. Blood serological examinations are so routine with us as the taking of the patient's name and address. We have been using this since the inception of our clinic in 1932. Using this procedure, we examined serologically 14,355 women and our figures of syphilis complicating pregnancy are:

Year—1932 White .....	3% ; Colored	7%
Year—1933 White .....	4% ; Colored	6%
Year—1934 both White and Colored.....	5.3%	
Year—1935 White .....	3.5% ; Colored	7.9%
Year—1936 White .....	3.2% ; Colored	8.5%

We treat our patients as soon as a diagnosis is established. In treating these women we have three major aims: 1. The immediate effect on the outcome of the existing pregnancy; 2. The protection of the fetus in possible future pregnancies; 3. the cure or arrest of the syphilitic infection of the mother. During the period of gestation it is our custom to rely on bismuth since bismuth is the least hepatotoxic and nephrotoxic anti-luetic drug we possess. In the last five years we gave over 10,000 neo and bismuth injections without a single serious complication. We studied the effect of bismuth on the prevention of prenatal syphilis and we are convinced that it is as effective as neoarsphenamine and much more effective than mercury. Following the termination of pregnancy, we ask the mothers to return to the clinic with the infant three weeks post partum. In well equipped hospitals it is possible to establish a diagnosis of prenatal syphilis in an infant before the child is three weeks old. This is possible by the microscopic study of the placenta, by the darkfield study of the cord, by the x-ray examination of the long bones. We do not possess these facilities. The cord Blood Wassermann is not reliable. The blood of the infant in the first three weeks is also not reliable. Hence, we wait three weeks. If at the age of three weeks the child shows clinical signs of syphilis or the child's serology is positive, we institute acetarsone therapy. If the child's blood is negative, we repeat blood tests at the age of two months, four months, six months and one year. If all these tests are negative, we feel that the child escaped infection. At no time do we label a child *luetic* simply because the mother's serology is positive. We feel that the child has a constitutional privilege to



an exact diagnosis. When the mother returns to our clinic post partum, we begin treatment for our second and third major aims. We try to give enough treatment to cure or arrest the disease. Here we employ all our antiluetic drugs: neo-arsphenamine, bismuth, mercury and iodides. At each clinic visit the patient's blood pressure is determined and a urine analysis is run. Incidentally, we find that bismuth has a beneficial effect on hypertension.

It must be remembered, however, that not all cases of syphilis complicating pregnancy diagnosed by us received treatment. In many instances our patients reported only at term or in labor and while the blood tests disclosed syphilis the patient did not receive any prenatal treatments and failed to return for postnatal care. Some of our patients were receiving anti-luetic treatment in various other clinics in the city and received from the center only obstetrical care. In our Luetic Clinic, we treated 247 patients. Of these 247 patients who received specific treatment during pregnancy, we were able to follow up only 116 cases. On these 116 patients we have complete data as to the results of our specific therapy. Our patients come from that class of our underprivileged families who lead a life of nomads. Often they move their residence each week, frequently from one city to another. Hence, I believe that our social service worker performed a Herculean task when she succeeded in tracing 116 families.

These 116 pregnancies terminated in:

Premature delivery .....	3
Dead fetus .....	2
Live child .....	111

The serology of the 116 children take at various ages—from birth to age of six months was:

Positive .....	9
Negative .....	107

The serology of the 116 mothers taken during pregnancy was:

Negative .....	32
Positive .....	84

The postpartum serology of these 116 women was:

Negative .....	63
Positive .....	53

These 116 cases were divided clinically into the following stages of syphilis:

Primary .....	1
Secondary .....	10
Latent .....	93
Prenatal .....	12

The diagnosis of syphilis of the mother was made in the following months of pregnancy:

1st .....	2
2nd .....	4
3rd .....	8
4th .....	18
5th .....	17
6th .....	30
7th .....	28
8th .....	7
9th .....	2

The age of our patients varied from 15 to 41 years of age:

Age 15 to 21.....	28
Age 21 to 31.....	57
Age 31 to 41.....	28
Age over 41.....	3

As to race our patients were divided into:

White .....	29
Colored .....	75
Mexican .....	12

We made a special effort to study the nine infants who were born with a positive serology:

1. Mother had Lues I—Diagnosis was made in 7th month. Received 7RX, Lues (Latent Lues).
2. Mother had Latent—Diagnosis was made in 7th month. Received 5RX.
3. Mother had Lues II—Diagnosis was made in 8th month. Received 2RX, Lues (Latent Lues).
4. Mother had Latent—Diagnosis was made in 6th month. Received 9RX.
5. Mother had Lues II—Diagnosis was made at term. Received none. Lues (Latent Lues).
6. Mother had Latent—Diagnosis was made in 5th month. Received 2RX, Lues.
7. Mother had Latent—Diagnosis was made in 4th month. Received 10RX, Lues.
8. Mother had Latent—Diagnosis was made in 6th month. Received 12RX.
9. Mother had Latent—Diagnosis was made in 6th month. Received 11RX.

Do we fail in our aims? Are syphilitic children born to our patients? Unfortunately, *yes*. The *reasons* for our failures, however, can not be entirely laid to lack of medical care or to the inefficiency of our methods. Our failures are due to:

1. Low intelligence quotient of some of our patients so that they report to the prenatal clinic only in the last trimester.
2. Lack of adequate follow up work on account of insufficient finances.
3. Lack of cooperation of our public health department, or lack of sufficient laws to enable

the public health department to enforce treatment.

It is my belief that every woman who has syphilis is in a contagious and infectious stage of the disease throughout her child bearing period. The clinical classification of syphilis may place her infection in the latent stage but, nevertheless, she is ever ready to transmit the disease to her offspring. A pregnant syphilitic woman who refuses or willingly neglects treatments is as much a danger to the welfare of a community as a case of smallpox, and much more than a leper. Such individuals who know that they have syphilis, who know that they may transmit the disease to their child and yet refuse treatment should be by law quarantined in a contagious disease hospital for the sake of the unborn child, and for the sake of mankind.

It is my sincere hope and wish that the coming decade will bring a generation of social minded physicians who will think not only in terms of individual welfare but in terms of social and national welfare, that our medical social service workers will look upon the presence of delinquent luetic patients as a reflection against their proficiency and efficiency and professional competence, and that our health departments both municipal and national will react with the same anxiety to the presence of a single new case of prenatal syphilis in their community as they do now to a case of smallpox. The complete eradication of congenital syphilis from our midst is medically possible. May that day be with us soon.

185 N. Wabash Ave.

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#### PHARYNGEAL DIVERTICULA

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Formerly in the literature, the pulsion type of diverticulum, which arises from the lower end of the pharynx, was termed "Esophageal Diverticulum" by Gerard, Goldman, Halstead, Bevan, Jackson, Judd, Lahey, Mayo, Murphy and Zenker. More recently, Judd, Lahey and others have written of these diverticula under the title of "Pharyngeal Esophageal Diverticula." Moynihan states, "There is no such thing as 'Phar-

yngo Oesophageal' Diverticulum. There are 'Pharyngeal' Diverticula and 'Oesophageal' Diverticula." In his opinion, these are pharyngeal. Most authors writing on this subject now are in accord with his view.

The site of origin of these diverticula has been quite definitely demonstrated—that they arise from the lower posterior wall of the pharynx above the sphincter formed by the cricopharyngeus muscle, and that they do not occur in the Laimer Haeckermann area as was formerly thought to be the case. Zenker's name should not be attached to these interesting sacs as they were most accurately described and perfectly illustrated by Ludlow in a letter to William Hunter in 1764. His specimen of a "Preternatural dilatation of, and bag formed in, the pharynx" is still perfectly preserved in the Hunterian Museum at Glasgow. Monro, Sir Charles Bell, Matthew Baillie and others gave accurate descriptions of the condition.

Various authors have spoken of "Lainer Hackerman area." It is "Laimer," who was prosector at Graz, and "Haeckermann," now of Bremen (Thesis dated 1891), in whom interest centers. To correct the spelling of these names, they become "Laimer-Haeckermann." Moynihan, in a forcible but friendly letter in the interest of accuracy, has called attention to the above named incorrect references and misspelled names. It is unfortunate that such an interesting subject as this has been described under various titles. In reviewing the literature, many excellent articles may escape one's notice. It is hoped that in the future, articles published on this subject will be correctly titled "Pharyngeal Diverticula."

These diverticula are generally described as occurring on the left side. At the present time, many right-sided diverticula are reported. In Sturgeon's series of cases, more than one-half were on the right side.

As to whether the operation shall be done in one or two stages, much can be said for both views. Moynihan, Jackson and others have all reported successful results from the one stage procedure. The majority of American operators, however, still operate in two stages. The main argument in favor of the one stage operation is that it is more surgically perfect if done in one stage instead of two. However, it is not comparable to a one or two stage prostatectomy.

The one stage operation will suffice when oper-



ation is done the second time, for recurrence. Here, in all probability, the prevertebral space with its lymphatics will be sealed off and the mediastinum well protected, should subsequent leakage take place.

The two stage operation gives excellent protection against the dreaded mediastinitis and entails very little additional hospitalization. The second stage of the operation is insignificant as to technical difficulties, or risk and discomfort to the patient. It is done under infiltration anesthesia about ten days following the first stage. The wound is re-opened to the neck of the sac, the neck of the sac ligated, sac removed and the wound closed; a small rubber drain being placed down to the stump of the sac.

Considering all phases applicable to the surgical treatment of pharyngeal diverticulum, it seems that the two stage operation offers much more security to the patient and should be the procedure to be followed.

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#### X-RAY OF THE ABDOMEN IN LEAD COLIC—REPORT OF A CASE

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Although it long has been recognized that lead intoxication is the possible cause of intestinal obstruction, there are few reports of cases, in the recent English and American literature, showing so complete an acute intestinal obstruction, clinically and roentgenologically, as to war-

rant an exploratory laparotomy. We present such a case stressing particularly the abdominal x-ray findings, about which very little has been written. Aub, in his personal experience, has seen only three such cases.

In a recent review concerning the value of the Roentgen ray in the diagnosis of intestinal obstruction the following criteria for the diagnosis of mechanical obstruction were established. "First, there must be a degree of distention of the small bowel beyond its normal lumen; second, this condition of increase must persist upon repeated examinations." The presence of fluid levels in the small bowel are important and corroborative, but by no means essential. While various lesions are reported that may present such a picture, no mention is made of the fact that lead colic may do so.

Aub, et al, in their monograph on lead poisoning, report that x-ray pictures taken during the acute phase of a very severe lead colic, following the ingestion of a barium meal, show definite areas of spasm of the intestinal musculature. This observation fits in well with the conclusions drawn from experimental lead poisoning of cats. It was shown that lead acts on the musculature of the small bowel of the cat in such a way as to produce areas of increased tonus and decreased motility, and that colic is probably due to a hypertonic peristaltic wave approaching such an amotile spastic area.

Considering the above mechanism it follows that if these amotile spastic areas maintain their increased tonus for any length of time, distention and stagnation may appear in the bowel proximal to the "obstruction" identical with that found in acute mechanical ileus. In such a case a flat x-ray plate of the abdomen taken a number of hours after the onset of lead colic may have the characteristic roentgenogram of intestinal obstruction. Our case does this.

#### CASE REPORT

C. P., a twenty-five year old white male, entered Cook County Hospital July 3, 1936. Except for occasional colds he had never been sick until ten days before entrance, at which time he became aware of abdominal cramps, periumbilical in location and not very severe. At the onset the pains occurred every two or three hours and lasted three to five minutes, and were accompanied by no vomiting, change of bowel habits, or urinary abnormalities.

Three days before entrance he was suddenly seized with severe mid-abdominal cramps which doubled him up. The pain did not radiate. He became nauseated

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and vomited a greenish material a dozen or more times. Morphine brought relief from the pain. During these three days he had no bowel movements. Three enemas were given without result. He ate nothing, as he was afraid of vomiting.

Inventory by systems was essentially negative except for the above complaints. The past history revealed an attack of measles and "blood poisoning" in 1919. The only previous surgery was a tonsillectomy. Venereal infection was denied.

For the three months previous to his admission, the patient worked in a casket factory polishing lead caskets. In the process of polishing, lead dust entered the air. He had always been careful to wash his hands before eating, and he handled his food in wax paper. He specifically stated that he knew of no fellow workers who had any of the symptoms from which he was suffering.

Physical examination on admission revealed a well developed, well nourished white male obviously in acute distress. His knees were drawn up and his hands clasped to his abdomen. T. 100.6; P. 80; R. 20; B. P. 160/90. The essential findings included a suggestive bluish discoloration of part of the gum margins, slight cervical adenopathy and normal heart and lungs. The abdomen was slightly distended, soft and tympanitic. There was no localized tenderness except over both costovertebral angles. Peristalsis was somewhat exaggerated, with occasional obstruction borborygmi, mostly bell-like tinkles but some gurgling borborygmi. Rectal examination was negative. The reflexes were physiological.

Laboratory findings included—R.B.C. 3,800,000 with 3 basophilic stippled cells per 400 R.B.C., W.B.C. 23,000 with polymorphs 84%, lymphocytes 13%, and monocytes 3%. Urine analysis was negative. The icterus was 9.

In view of the rather indefinite picture a positive diagnosis could not be made. It was the impression that a subacute intestinal obstruction existed. With the history of lead contact, a suggestive lead line, some stippling of the red blood cells, hypertension and obstipation, lead colic was considered most likely. Mechanical ileus and renal colic were also considered.

The distention and colic continued in spite of ileus therapy throughout the day. Enemas returned highly colored, but without fecal material. Fluoroscopy revealed dilated small and large bowel. Mineral oil taken by mouth returned per rectum six hours after administration. An emergency flat plate of the abdomen six hours after fluoroscopy revealed characteristic paralleling of the dilated small bowel loops, which was deemed to have increased during that time. (Fig. 1.)

Because of the acute onset of symptoms, the absence of previous constipation, the apparent absence of lead intoxication in other workers in the plant, a diagnosis of low grade mechanical ileus was considered possible. The apparent progression of the distention as indicated by fluoroscopy and roentgenography seemed to point toward this diagnosis. An exploratory laparotomy was done.

When the abdomen was opened (a right sub-umbilical

paramedian incision was made), no mechanical obstruction was found. The small and large bowel were dilated and three areas of spasm, each less than two inches long, were found in the lower small bowel. An appendectomy was done.

Postoperatively the course was rapidly downhill. Peristaltic sounds which had become normal after operation disappeared; the temperature reached 105 degrees and the patient died 60 hours after operation.

Post mortem examination revealed an acute fibrinous peritonitis and hypostatic pneumonia of the right lower lobe. Examination of the organs by the coroner's chemist revealed 0.6 mg. of lead per 100 grams of liver; 1.08 mg. of lead per 100 grams of kidney. Tests for other heavy metals were negative.

### SUMMARY

1. X-ray plates taken during an acute attack of lead colic may fulfill the established cri-



Fig. 1. Flat plate of abdomen showing "step ladder" arrangement of dilated loops of small intestine.

teria for the roentgenological diagnosis of intestinal obstruction.

2. Colic is a dynamic obstruction produced in the small intestine by amotile, tensely spastic hypertonic areas, which act to constrict the lumen.

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## MODERN MANAGEMENT OF VARICOSE VEINS

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The modern treatment of varicose veins, consisting of ligation and injection, has become widely accepted, and has almost entirely replaced the older forms of therapy. Since its introduction, however, it has undergone a gradual evolution, the successive steps of which have tended to diminish the discomforts, eliminate the dangers and improve the results of management. This development has followed two main trends, the search for an ideal sclerosing agent and a growing emphasis on the importance of the hydrodynamic problems involved. The latter has resulted in ligation becoming an indispensable factor in an ever increasing percentage of cases, with more and more insistence upon the highest possible site of ligature. It has also given rise to the attempt to obliterate the highest portion of the saphenous trunk by the peripheral injection of sclerosing solution at the time of ligation. Cumulative experience has stressed the necessity of adequate therapy, failure of which is responsible for most of the unsatisfactory results obtained.

The approach to the treatment of varicose veins requires a clear conception of the problems entailed. The anatomy and normal and pathologic physiology of the venous circulation of the lower extremities must be kept in mind. To briefly summarize the anatomical arrangement, the venous return from the lower extremities is effected by two sets of veins, the deep and the superficial. The former lie deeply imbedded in the heavy muscles of the leg. They are equipped with valves which open upward, and permit the blood to flow toward the heart, but prevent its reflux in the opposite direction. Because of the support afforded these vessels by the surrounding muscles and the pumping action they exert, the deep veins cannot dilate or become varicose. The second set of veins, consisting of the long and short saphenous veins and their tributaries, are superficial, and lie in the soft and yielding subcutaneous tissues. They, too, have valves which enable them to convey the blood upward, against gravity. Lacking external support and

the aid of muscular pumping, however, they must depend upon their inherent strength and elasticity for withstanding the hydrodynamic pressure exerted upon them. Whenever the stress on the vein wall becomes greater than the capacity of that wall to support, stretching or dilatation ensues. If the diameter of the vein exceeds the combined length of the two valve cusps, closure of the valve becomes impossible, and reflux occurs.

A third component of the venous drainage of the leg which receives little attention from the anatomists, but which is of enormous significance physiologically, is the series of communicating veins. These vessels, which are variable in position, size and number, perforate the deep fascia and anastomose the superficial and the deep veins. They are also supplied with valves which open inward to allow blood flow from the superficial to the deep veins, and to prevent regurgitation. Thus, the blood from the superficial areas of the leg may reach the trunk by way of the saphenous vessels which terminate in the deep veins, or by way of the communicating veins, into the deep ones and thence up to the heart.

Before undertaking to treat a patient for varicose veins, it is essential that the status of the venous circulation be determined. For this, the Trendelenburg test is indispensable. This test consists, as is well known, in emptying the superficial veins by elevating the extremity, applying pressure by means of a tourniquet about the thigh, or better, by digital compression over the sapheno-femoral junction, and observing the filling of the veins when the patient resumes the standing position. There are three possibilities. In the limbs with normal venous circulation, while the constrictor is in place, the veins fill slowly from below upward, as arterial blood reaches the capillaries, thence the venules and eventually the large superficial vessels. If the pressure above is released, no additional filling is seen, as the functioning valves prevent reflux from above downward. This is designated a negative Trendelenburg test.

In patients with varicose veins, the test is invariably positive, as the definition of the condition implies. In such instances, filling from below is as slow as in the normal. But when the pressure is released, there is visible and palpable filling from above, indicating beyond any question, that the valves in the saphenous system

are incompetent and that the direction of blood flow in those vessels is reversed.

In a very occasional patient, the valves in some of the communicating veins may be incompetent. This is usually a sequel to phlebitic disease of the communicating veins, in which the valves have been damaged. In such patients, the saphenous veins may also be varicose. When the patient stands, while pressure is still applied above, the veins fill rapidly from below, becoming distended in from five to fifteen seconds, instead of the usual forty-five to sixty (thirty seconds has arbitrarily been taken as the limit of abnormally rapid filling). This rapid filling indicates that, as a result of the incompetence of the valves in the communicating veins, the blood flows unimpeded from the deep veins to distend the superficial. By varying the site of compression, the exact location of the incompetent communicating vein may be determined. If the saphenous trunks are also varicose, removal of the pressure permits further filling from above downward. When this is present, the test is considered to be doubly positive. Under these circumstances; there may be severe crippling of the return circulation from the superficial structures. Fortunately, this status is but rarely encountered.

Reversal of the direction of blood flow, as is indicated by a positive Trendelenburg test, represents the fundamental physiological disturbance due to varicose veins, and constitutes the indication for treatment. Irrespective of what has gone before, if the Trendelenburg test is positive, it shows that the superficial veins have not only lost their function as veins, but are actually interfering with the return flow by permitting reflux in the opposite direction. Under such circumstances, the circulation would be improved if the incompetent veins were removed or destroyed. This forms the basis of the entire philosophy underlying the treatment of varicose veins.

We recognize but one absolute contraindication to obliterative treatment, namely, active inflammation of the varices. Even this contraindication is not universally respected, some authors even advocating obliteration as treatment for phlebitis of varicose veins. There are, in addition, several relative contraindications, those that apply to all non-imperative therapeutics. They include concomitant diseases more serious than

the one under treatment, and which might be aggravated by the treatment under consideration. Thus, we do not advise active treatment in patients of advanced age, in the presence of severe cardiac or renal disease, or in hyperthyroid states. Controlled diabetes or compensated cardiac lesions do not contraindicate treatment. Treatment may be instituted during the early months of pregnancy, if the veins are of such proportions as to cause material discomfort. During later stages of pregnancy, palliative measures should be relied upon. The injection of quinine-containing solutions may be injudicious during pregnancy.

A history of old deep-vein phlebitis does not contraindicate treatment for varicose veins. The text-books warn that, in such patients, the enlarged superficial veins may be compensatory for the occluded deep ones, and that dire results might follow their destruction. The danger is exaggerated. Persisting occlusion of the deep veins is one of the rarest phenomena encountered in the study of venous diseases of the extremities. Furthermore, if the Trendelenburg test is positive, as is almost always the case, the superficial veins are carrying the blood away from the heart. Since there are only two possible routes by which the blood may leave the extremity, the deep veins must be open.

If there is any doubt as to the patency of the deep veins, the Perthes test may be applied. This is somewhat on the order of a reversed Trendelenburg test. The patient is allowed to stand until the superficial veins become tense and engorged with blood. The constrictor is then applied and the patient kicks the foot fifteen or twenty times. At the end of the period of exercise, the veins are found to be emptier than they were at the beginning of the test. The explanation is obvious. With each contraction of the muscles, the blood is forced upward out of the deep veins. When these are emptied, blood from the superficial veins is drawn through the communicating veins, into the deep ones, thence back to the heart. Inasmuch as the constrictor was in place during the period of exercise, it could not have left the extremity through the superficial veins; therefore, it must have gone through the deep ones. A simple modification of this test is to apply the constrictor, and then elevate the limb. The veins empty, indicating that the deep veins are patent.



The choice of treatment in a given case is also dependent, largely, upon the Trendelenburg test. If the tributaries of the long saphenous are affected, as is most frequently the case, reflux is almost always from the sapheno-femoral junction downward. In many such instances, the long saphenous is not palpably enlarged above the knee. If careful search is made over the foramen ovale, however, a tense, dilated saphenous trunk can usually be palpated. Trendelenburg test by finger pressure over this point indicates beyond any question that the reflux begins at the junction of the saphenous vein with the femoral. In such patients, it is obvious that injection of the varices below the knee, without preliminary ligation, is inadequate. Obliteration in the face of excessive back pressure, like damming a swiftly flowing stream, is difficult, if not impossible. At best, many injections are required, and if obliteration is effected, recurrences within a period of months is the rule. In accordance with the laws of hemo-dynamics, early canalization of the thrombi occurs, or new vessels dilate to take the place of those occluded. By far the most important single cause of failure or recurrence in the oblitative treatment of varicose veins is failure to do ligation in cases in which ligation is indicated.

The indication for ligation depends, then, upon the amount of back pressure within the veins; and the site of ligature is determined by the source of the back flow. In large varicosities involving the saphenous trunk to the groin, or in those below the knee in which the tension is great, the indication is absolute. When the veins are small in size and number, and if the tension is slight, the indication is relative. Whenever injections fail to achieve their purpose, ligation is usually needed. Varicosities of the short saphenous can usually be made to respond to injections alone, and rarely require ligation. The explanation for this, as Edwards has pointed out, lies in the fact that the terminal portion of the short saphenous vein is subfascial, hence supported, and that its opening into the popliteal vein is guarded by efficient valves.

The site of ligation is important. Edwards<sup>1</sup> has pointed out that the evolution of saphenous vein ligation is an upward progression of the site of ligature. Our own experience has undergone a similar evolution. Ligation of the saphenous trunk in continuity is almost invariably

followed by the development of collaterals in the scar, bridging the severed ends of the vessel. The saphenous trunk must be divided at its point of confluence with the femoral, above its uppermost tributaries. Reduplications of the saphenous must be looked for, and if present, also tied and cut. If some of the reflux is due to incompetent communicating veins, such anastomotic vessels must also be severed at their junction with the superficial veins.

Even when the ligature has been placed in the correct position, an occasional recurrence is seen. In such cases, at reoperation, numerous small tributaries may be found entering the saphenous trunk from all directions, carrying into it a sufficient quantity of blood to provide a material degree of reverse pressure. This infrequent recurrence can be prevented if the proximal portion of the trunk is obliterated in situ, so that there is no waiting channel into which such veins can open. This is best accomplished by injecting it at the time of ligation, when the vessel is exposed. Later injection may be difficult or impossible because the saphenous trunk lies deeply buried in the fatty tissues of the thigh. Palpation of the vessel is rendered still more difficult by the absence of tension within it, due to the ligation. The injection of a small quantity of sclerosing solution at the time of ligation is remarkably effective because of this stasis, and often results in obliteration of the entire saphenous vein.

The technic of ligation merits little attention in this discussion. If the simultaneous injection of the saphenous trunk is to accompany the ligation, hospitalization for twenty-four hours may be desirable, although in our clinic ambulant ligations are still the rule. Marking the position of the vein in the foramen ovale, while the patient is in the standing position obviates the need for undesirable dissection in search of the vessel. The operation is regularly done under local anesthesia, using one per cent. procaine solution. Caution against injecting the anesthetic solution into the lumen of the large blood vessels of the area is urged. An oblique incision, parallel to the lines of cleavage of the skin leaves the least disfiguring scar, and gives satisfactory exposure. Emphasis is placed on the avoidance of trauma to the vein during the dissection, especially until the central ligature is placed. The vein is isolated above its highest tributaries, and

doubly ligated with catgut. Before the distal ligature is tied, 2 cc. of sclerosing agent (sodium morrhuate) are injected peripherally, and the ligature is pulled taut as the needle is withdrawn. The vein is then divided between the two knots. Two or three interrupted cutaneous sutures suffice for closure. A spica of elastic bandage or stockinette is applied over the dressing to minimize the accumulation of blood or serum in the wound and, in ambulant operations, to secure against hemorrhage from a slipped ligature after the patient leaves the operating room.

As a result of the distal injection, the saphenous trunk usually becomes obliterated from the groin to the knee, and sometimes even lower. The amount of phlebitis induced produces, of course, a corresponding degree of discomfort and disability. This is rarely severe enough, however, to require recumbency. Moderate activity is permitted from the first, and within a very few days, a full range of activity is possible.

Injection of the remaining veins is begun as soon as the wound has healed, and the reaction has subsided. Remarkably few injections are required for the complete eradication of varices following ligation and injection, as compared with the numbers formerly needed. The technic of injection is as simple as it is possible to make it. If the veins are large enough to be seen with the patient in the sitting position, the leg is kept horizontal; if not, the patient is injected in the standing position. We do not use tourniquets, occluders or other technical devices. The skin over the vein to be injected is cleansed with alcohol, the needle is inserted, and when free back-flow into the syringe is assured, the solution is injected. Gentle pressure with the tip of the left index finger at the site of injection gives assurance that the solution is entering the vein, and, at the same time, empties that portion of the vein of blood. As the needle is withdrawn, a pad of gauze or felt is applied with a strip of adhesive tape to compress the vein at the site of injection. As a rule, two injections are given at a sitting, although this is purely arbitrary, and the sittings are repeated at intervals of one week.

As to the choice of sclerosing agent, we have almost entirely abandoned all others in favor of solutions of soaps of fatty acids, of which sodium morrhuate is the prototype. The action of these soaps is entirely non-specific, and we use the morrhuate and simple potassium oleate inter-

changeably. These solutions are painless, effective in small doses, non-toxic and have little tendency to cause sloughing if injected, in part, outside the vein wall. The only type of unfavorable reaction we have encountered is an occasional allergic response in persons sensitive to these substances. To avoid the risk of such reactions, we have advocated<sup>2</sup> a preliminary trial injection not to exceed  $\frac{1}{2}$  cc. before instituting full dosage. In patients who are to have ligations, we give a preliminary injection, in order to permit a full injection at the time the ligation is done. The dosage of these solutions varies from  $\frac{1}{2}$  to 2 cc., and average about 1 cc. In the rare patient who is sensitive to the soaps, and we have found that those intolerant towards sodium morrhuate also react to potassium oleate, we use quinine and urethane as the sclerosing medium.

With the management here described, the treatment of varicose veins has proved essentially satisfactory. It requires comparatively little time and gives promise of lasting benefit. The results have improved with each step in the evolution of the modern procedure, until now it is felt that, with adequate therapy, most patients with varicose veins can be given relief.

*Summary:* The modern treatment of varicose veins, by ligation and sclerosing injection, gives satisfactory results and promise of permanent relief. Emphasis is placed on the hydrodynamic problems involved and the importance of the Trendelenburg test in determining the indications for and the site of saphenous trunk ligation. Peripheral injection at the time of ligation further reduces the likelihood of recurrence. Solutions of saponified fatty acids, of which sodium morrhuate is the prototype, have proved to be the most satisfactory sclerosing agents as yet available. The application of the tests of venous circulation and the technic of ligation and injection are described.

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A distinguished doctor at a lunatic asylum went to the telephone and found difficulty in getting his connection. Exasperated, he shouted to the operator.

"Look here, girl. Do you know who I am?"

"No," came back the calm reply, "but I know where you are!"—*Canadian Doctor*.



## HYPOTENSION OR LOW ARTERIAL PRESSURE

D. M. ROBERTS, M. D.

ALTON, ILL.

Almost every day a case of low blood pressure is seen. It is a common occurrence in clinics and private practice for some individual to enter the office and give, as a reason for being there, that they have low blood pressure. This one thing is so impressed on their mind that it is with great difficulty that the physician is able to secure any kind of a history—or even a satisfactory physical examination. Then again a patient may give a vague train of symptoms and upon examination a low pressure will be found. Thus it is found to be a very common cause of trouble, the victims being at best under par and easily fatigued. In these patients, often thought by their friends and doctors to be neurotic and neurasthenic, the hypotension factor is very often neglected, but even more than the neglect of the low blood pressure, is the neglect of the thing causing this condition. Therefore the condition of low arterial pressure is becoming a very important factor in medicine.

In the year 570 B. C. was the apparent first study of the pulse in health and disease by Herophiles. Various men gave some study through the ages to the circulation, considering pulse and blood pressure as best they could, but came to no definite conclusion. They had no means to connect their findings, no instruments which could be used, and as a result most of the knowledge, regarding blood pressure, has been gained during the past 30 years, since the advent of the mercurial manometer.

Today the sphygmomanometer, with its column of mercury, shows variations in the blood pressure just as a thermometer shows variations in the temperature, such as normal, sub-normal temperature and fever, by the mercury column. We meet all three phases of blood pressure many times in health and disease but our medical knowledge remains inadequate until all three phases are definitely understood.

There are certain accepted standards for normal blood pressure and the significance of high arterial pressure is generally appreciated. There is also a great amount of clinical facts

concerning low arterial pressure but what we need is correlation of this knowledge. When this is accomplished we may have a means of solving some of the puzzling questions in regard to abnormal variations in health and disease. Variations in arterial pressure should be regarded as evidences of altered physiological or pathological functions.

In the first place it is necessary to define hypotension and designate some mark for a division between normal and hypotension. Hypotension is the diminished or lowered tension in the arterial system and it has been generally agreed that 110 mm. of mercury or lower, when found in an adult, may be regarded as low arterial pressure. The diastolic pressure reading has not been brought into this consideration, since it has been found that there are changes in levels of this reading with very little significance in the general condition. The pulse pressure changes also seem to have little significance.

The arterial blood pressure is dependent upon four factors: 1st, the contracting force of the left ventricle or the energy of the heart. 2nd, the quantity or volume of circulating blood propelled by the contraction in the full arteries. 3rd, the elasticity of the vessels which is dependent upon the middle coats of the large arteries. 4th, the peripheral resistance.

Each ventricular systole forces about 60 ccs. of blood into the aorta. Assuming that the other three factors remain constant the pressure must rise whenever the energy of the heart is increased, and fall whenever it is decreased. The output of the ventricle is proportional to the cardiac energy and is based on the following factors: The volume of each discharge, the frequency of the repeated discharges or beats, and the force with which this is accomplished.

The elasticity of the vascular system presents itself as alternate distension and elastic recoil of the vessel wall and is due largely to the connective tissue framework. The aorta is not supplied with muscle cells and as a result merely serves as an elastic reservoir. The recoil of this vessel plays a great factor in the onward movement of the blood during the period in which the heart is resting. When the elasticity of the aorta is diminished by any means the pressure rises, also when anything causes unusual relaxation the pressure is lowered.

In the peripheral resistance the main factor

concerned is the arterial-capillary outlet. The arterioles have a heavy covering of smooth muscle tissue which, because of its contractile power, is able to diminish the outlet in the capillary system. This part of the system serves as a gate, which may be opened to a variable degree, the pressure rising if closed and lowered if open.

It would be a fairly easy problem to analyze changes in the blood pressure if only one of the four factors mentioned were affected. However there is usually a variable combination of two or more of the factors which will cause a very much more confusing condition. Similar complaints or findings need not be caused by the same variation in these factors.

Up to the present time there is no agreement as to the etiology of low blood pressure. That which is known seems to point to a definite underlying cause. Otherwise how are the many unrelated diseases and abnormal conditions, in which low arterial pressure is found, to be explained? Blood pressure is a function of the circulation as a whole, and the factor most frequently concerned in its variation, as to the lower end of the scale, is the vasomotor mechanism. There are some who claim low blood pressure is not a disease but in many instances of a diseased bodily state. To many persons low blood pressure may be compatible with perfect health. If we accept the definition that health is the state of an organism in harmony with its surroundings, and disease is the state of the organism in conflict with its environment, we will find that many persons have low blood pressure in both health and disease. We can find persons who go through life doing their work, enjoying themselves, and who have low blood pressure. The physician may find some conditions which he can point out as possible differences in this individual but which have in no way affected his health and always considered as personal characteristics, making him a different type. In fact we cannot give any single cause for all types of hypotension. Usually there may be the influence of several factors, such as structural change, disturbed nervous and chemical influences, which induce abnormal function. The resulting pathologic physiology is difficult to explain, since there is a lack of agreement between clinicians and the physiologists and biochemists.

We find hypotension in healthy individuals as well as diseased people. The instance of low

arterial pressure in a group of healthy individuals shows a surprising constancy. Extensive observation reveals that in a cross section of population between the ages of 17 and 30, there is an average of 3.5% occurrence of low blood pressure. This average is found by taking groups of all walks of life. However if we study a group of apparently healthy people, such as bank clerks, at the similar age, you will see something entirely different. In this special group 38% of the males and 55% of the females have a hypotension. This is a very interesting factor. It may be explained by saying that the individual, with a constitutional tendency to low blood pressure, is unable or unwilling to cope with rugged life and therefore hunts seclusion or the protection given by inside work. In a previously healthy individual, who has developed low blood pressure, we think of the disease being the factor causing the low pressure. Thus if there is a tendency to low pressure it need not be as severe a disease to lower the pressure to a still lower point.

The following table or list, taken from "The Cyclopedia of Medicine," Volume 3, Page 320 and 321, will serve to suggest where we can or will encounter hypotension.

#### "IN HEALTH"

- Infancy
- Childhood
- Adult, constitutional type
- Racial tendency
- Geographic location
- Climate
- Atmospheric conditions
- Body weight
- Body build
- Exercise
- Posture
- Respiratory system
- Heart
- Bloodvessels, capillaries
- Automatic nervous system

#### "IN DISEASE"

- Constitutional diatheses
- Disorders of respiratory system
- Disorders of heart
- Disorders of bloodvessels
- Disorders of blood:
  - Chemical
  - Physical
  - Morphological
- Endocrine system
- Disorders of nutrition:
  - Diabetes
  - Deficiencies
  - Cachexias



Physical and nervous exhaustion

Shock:

Medical

Surgical

Acute infectious diseases

Chronic infections:

Focal

Tuberculous

Syphilis

Acute intoxications:

Chemical agents

Food poisoning

Drugs

As to the symptoms these may vary greatly with the individual patient. Some will paint a very vivid picture for the doctor, making it hard in some cases for him to pick out all the essential points. In other cases they will give such a vague history and so few symptoms that it is hard for him to come to any definite conclusions. The 3.5% of humanity, with the essential hypotension, are in the front line and in case of unfavorable conditions will be the first to show the symptoms. The symptoms may be local or general. The most common symptom is the loss of their former sense of well being, this being replaced by early fatigue and physical exhaustion. They may also have motor instability. They may have apprehension, fears, nervousness, insomnia, inability to concentration, especially on anything except themselves, inattention and headache. Some have a ringing of the ears and generalized neuralgic pains, which are short, sharp and in various parts of the body. Some have abdominal pains, others have a sensation that their arms and limbs are going to sleep, also other parasthesias. Often there are precordial pains, which are often indistinguishable from true anginal pains, resulting in cause of great anxiety, both to the patient and to the doctor. There may also be dizziness, palpitation, faintness and syncope. All these symptoms are often brought on by exertion or any exercise which is more than the patient has been accustomed to doing. Also they may be brought on by over-eating.

In infancy the pressure is about 55 mm. of mercury at birth and gradually increases. In childhood, up to about 10 years of age, the pressure gradually increases to about 90 to 100 mm. of mercury, with adult pressure usually being reached at about 18 years of age. It is shown that hypotension, in healthy adults, according to many insurance companies, make exception-

ally good risks and usually live longer than expectancy, especially when the hypotension occurs after 50 years of age.

During sleep it has been found that the blood pressure falls, depending upon the depth of the sleep. If the person is restless during the sleep, the blood pressure may be increased to as much as 200 mm. Thus it has been shown that the blood pressure varies in response to the exercise and also to the type of exercise, depending upon the degree of muscular activity involved in the exercise.

It has also been found that there is a fairly definite relation between blood pressure and body weight at all ages. It is seen that in people who are obese, the blood pressure usually is at a higher point than for an average weight individual. It is also very often seen that in tall slender people the blood pressure is below normal. However we naturally can find cases which are exactly the opposite in any these conditions.

In most of the acute infectious diseases we find there is a lower blood pressure. The drop in pressure being more marked in some than in others. The following usually have a hypotension:

A. Typhoid fever: Except in certain complications the pressure usually gradually drops.

B. Pneumonia: Hypotension is usually found in the majority of cases, although it may not be present in severe cases.

C. Influenza: Usually present during the acute stage.

D. Diphtheria: Severe cases usually have a marked hypotension.

E. Scarlet fever: Pressure variations are not uniform and usually when present is due to vasodilation and weakness of the left ventricle.

F. Cholera: In the algid stage blood pressure usually falls.

G. Malaria: Hypotension is not always present but in severe cases may be very marked.

H. Epidemic cerebrospinal meningitis: Especially in adults, in severe cases there may be a very low blood pressure.

I. Typhus fever. Usually a very marked hypotension.

J. Trichinosis: Several cases have been reported where there is a very marked hypotension.

Hypotension is also found in several chronic diseases, such as the following:

A. Tuberculosis: In the markedly advanced stage where there is pronounced toxemia, a marked hypotension is the rule. In the early stages there is usually not constant hypotension.

B. Syphilis: Ordinarily there is no hypotension present in the early cases, but when it does occur it is due to a myocardial degeneration. Syphilis of the

adrenals probably would produce a marked hypotension.

C. Diabetes: Probably has little effect upon blood pressure.

D. Addison's disease: One of the outstanding features of this condition is the marked hypotension, although it is not necessarily present.

E. Food deficiency diseases: Usually present but not to a very marked degree.

F. Bronchial asthma: The hypotension in this condition is usually due to the lack of vasomotor tone, which is due probably to anaphylactic shock, as a result of a toxic split protein circulating in the blood.

G. Focal infections: Such as chronic inflammation of the tonsils, teeth, accessory nasal sinuses, gall bladder, etc., are frequently accompanied by marked hypotension. It may be a sign of great diagnostic value.

H. Non-infectious chronic arthritis: Certain cases of chronic arthritis apparently depend upon endocrinopathies, especially disorders of the thyroid. There is a low metabolic rate with lowered physical tone, bradycardia and hypotension.

I. Anemia: In those cases not due to hemorrhage there is often great hypotension. In pernicious anemia the pressure even goes as low as from 60 to 80 mm.

J. Cachexia: In advanced cases there may be an extreme hypotension.

In certain constitutional diathesis hypotension may occur.

A. Status lymphaticus: In this case low blood pressure is due to cardiovascular hypoplasia, with its resulting diminution in driving power.

B. Infantilism: Hypotension occurs practically in every case.

C. Myasthenia gravis: Low blood pressure usually present and although we cannot say the condition is due to a thymic lesion, irradiation of the thymus is usually followed by improvement.

D. Adiposis dolorosa: There is absolutely no agreement as to the cause of this condition, although the theory of endocrine mal-function appears best suited to explain the symptoms. Hypotension appears to be related with this gland lesion.

There are certain mechanical factors which seem to cause hypotension.

A. Postural change: Usually on arising from a supine position there is a slight drop in systolic pressure, a rise in diastolic pressure and a rise in pulse rate. The diagnosis of postural hypotension can be made upon the following phenomena:

1. Syncopal attacks on change of posture with a drop of the systolic blood pressure to the shock level.

2. Anhidrosis.

3. Increased distress during the heat of the summer months.

4. Slow and unchanging pulse rate with marked variation of the blood pressure.

5. Slight decrease in the basal metabolic rate.

6. Signs of slight and indefinite changes in the central nervous system.

7. Blood urea at the upper normal level.

There may also be a false general appear-

ance of youth in comparison to the true age. Pallor of the skin and mucous membranes and secondary anemia.

B. Body Habitus: It is not proved that this condition itself causes hypotension.

C. Effects of exposure to high temperature: It has been shown that this causes a marked dilation of the peripheral vessels, causing a relative diminution of blood volume.

D. Variations in atmospheric pressure: It is known that there is a disturbance of physiologic function resulting from high altitudes, as a result of the deficiency of oxygen.

It has been shown that various tissue extracts have a depressor effect on blood pressure. It was formerly thought that histamine was the only constituent of tissue extracts, capable of lowering the blood pressure, but probably this is not true, as some very good effects seem to be secured by injection of liver extracts in treating hypertension. Such glandular extracts as parathyroid extract and thyroid extract appear to have a slight ability in reducing blood pressure. Along with other drugs and tissue extracts it is shown that extracts from reproductive organs, both male and female, have an influence to reduce the pressure.

Various drugs appear to have a definite action on lowering blood pressure, and must be watched when being used. The nitrite group should not be used in marked arterial hypotension, or in shock. Alcohol in large quantities causes a marked fall in pressure, and is not advisable, as a stimulant, in conditions of low blood pressure. Quinidine sulphate usually causes a drop in blood pressure on being used intravenously. Salvarson causes a reduction of blood pressure but usually not to a degree to endanger the individual when being treated, however, in cases of marked hypotension, injection should be made cautiously. Cinchophen has been known to cause a drop in the pressure. Caffeine in cardiac inefficiency causes a drop in blood pressure by dilating the coronaries.

We have temporary or acute hypotension and essential hypotension. The acute are caused by anaphylactic shock, traumatic shock, surgical shock and from anesthetics. The anesthetics cause a fall if used over a long time. Chloroform causes the earliest fall; ether, a less marked action; nitrous oxide-oxygen, very little fall unless used over two hours.

After considering the foregoing we may well ask "What is the outlook for the individual with



low arterial pressure in health or disease?" As was pointed out earlier after middle life there seems to be a better life expectancy. This is not necessarily due to the fact that they can stand more but on the other hand protect themselves so there is not so great a chance for trouble. In sickness and operations a gradually falling pressure is usually unfavorable. However if the pressure is sustained, although low to start, the prognosis is good.

As to the treatment of this condition there is no specific drug or method. The physician must be ready and willing to use whatever he deems necessary for the good of the patient. What proves useful in one case, will have no effect in another case. If there is a specific disease or cause, this is naturally treated, with a satisfactory result secured for the patient. If no cause can be found then the result will very probably be a failure.

The point that I should like to bring out is that the public hears a great deal about hypertension; and this same public, in general, does not hear so much about hypotension. Fortunately, hypotension is not nearly as dangerous as is the case of hypertension. "Hypotension is not necessarily confined to the asthenic person, or to the patients of little efficiency. It can and does occur, not infrequently, in persons of normal build, of hypersthenic habitus, in quite normal efficiency, or normal weight or even in the obese; and per se essential or incidental hypotension is attended with little or no clinical significance."

It is well to remember that the chief cause appears to be physique, and this in turn is determined largely by heredity. The physician must recognize many points of importance and attempt to correct them. He must recognize the importance of correct feeding in all ages, and counteract the fad of dieting to become excessively thin, which has, undoubtedly, contributed to the number of people who are victims of this condition.

It is necessary to realize the importance of climate, proper clothing, maintenance of normal body weight, need of daily physical exertion, sufficient hours of rest and healthy posture. Avoid things which cause cardiac and circulatory strain. Avoid over taxation of the nervous system. Prevent or remove infections, avoid endogenous and exogenous intoxication and correct the endocrine disturbance when possible.

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## DERMATOLOGIC VERSUS SURGICAL TREATMENT OF CARBUNCLES AND FURUNCLES

In order to ascertain the accepted methods of treating carbuncles and facial furuncles, Samuel Ayres, Jr., Nelson Paul Anderson and Paul D. Foster, Los Angeles (*Journal A. M. A.*, March 13, 1937), mailed approximately 500 questionnaires to representative dermatologists and surgeons in all parts of the country. A tabulation of the results of these questionnaires revealed the fact that dermatologists tend toward conservatism in the treatment of carbuncles, whereas surgeons are more inclined to use radical procedures. Both dermatologists and surgeons usually practice conservatism in the treatment of early facial furuncles. Dermatologists employ x-rays much more frequently than surgeons. The average duration of treatment by surgeons was nearly twice as long as under dermatologists. The mortality was greater under surgical than under dermatologic treatment. Without exception, dermatologists who answered this question reported good cosmetic results in cases treated conservatively. Most of the surgeons ignored the question and a few reported cosmetic results as being from fair to good. The technique employed by the authors is described. It includes unfiltered x-rays, specific immunization, local applications, drainage, phenol puncture and general care. Any physical abnormalities such as anemia, focal infection, diabetes or gastro-intestinal disorders should be sought out and treated. Dietary indiscretions should be corrected and an adequate vitamin intake assured. The use of yeast or tin preparations has not proved efficacious.

## THE IMPORTANCE OF THE LYMPHATIC CONSTITUTION IN SURGERY

A complete physical examination of patients before operations should include examination of lymph follicles of the tongue; lymphocytosis should also attract attention. Positive findings suggest a further search for stigmata of lymphatic constitution. If such are found, a roentgenogram of the region of the thymus gland should be made. If a persistent or hyperplastic thymus is present, it should be irradiated before any surgical procedure. Thymic hyperplasia, with or without ob-

jective symptoms, is potentially dangerous to life. If patients with status thymico-lymphaticus are operated upon, special care must be taken to avoid traumatism; tissues should be handled gently in order to avoid the formation of adhesions. This applies chiefly to laparotomies and operations on joints.—Dr. Jos. K. Narat, in *Am. J. Surg.*, Oct., 1932.

## Society Proceedings

### MERCER COUNTY

Dr. C. M. Murrell of Sherrard was elected president of the Mercer County Medical society at the annual business meeting, April 13, at the public library rooms in Aledo. He succeeds Dr. L. L. McIntyre of New Boston, and served during the past year as vice-president.

Dr. L. E. Robinson of Aledo was elected vice-president and Dr. V. A. McClanahan of Aledo was re-elected secretary-treasurer. Appointed as members of the board of censors are Drs. J. W. Wallace and C. O. McCreedy of Aledo and T. D. Coe of Keithsburg.

Dr. McClanahan was elected as the delegate to the annual meeting of the state medical association in Peoria on May 18, 19 and 20. Dr. Walter Miles of Viola was elected alternate delegate.

Features of the program were talks by Dr. Frederick H. Lamb of Davenport, who discussed "Comparison of Defects in Various Types of Anemia," and Dr. Harold M. Camp of Monmouth, secretary of the Illinois Medical Society, who spoke on eradication of syphilis. His talk was illustrated with lantern slides.

### OGLE COUNTY

Ogle County Medical Society met at Dr. Kittler's home, Rochelle, April 22, 1937.

Dr. Hart E. Fisher, Chief Surgeon Chicago Rapid Transit, gave a very instructive talk on "Mental and Physical Causes of Accidents in Industry."

Following the talk and discussion a film was shown of the highly efficient system of physical examinations employed by the Transit Company. The guests were all invited to partake of a delicious luncheon served by our hostess.

A. R. Bogue, Sec'y.

## Marriages

ROMUS ARNOLD, Joliet, Ill., to Mrs. John Edgar Brock of Evanston in Lansing, Mich., in March.

JUDD R. BREAKSTONE to Miss Gertrude Stern, both of Chicago, January 29.

CLARENCE S. COSTIGAN, Moline, Ill., to Miss Frances Ostewig of Chicago, Nov. 26, 1936.

LESLIE D. DARNER to Miss Lucie Demery, both of Granite City, Ill. in Palmer, March 28.

JOSEPH G. GUSTAFSON, Moline, Ill., to Miss Hilda Koosman of Wausau, Wis., Sept. 21, 1936.

## Personals

Dr. John J. Hammond, St. Louis, discussed pneumonia before the Madison County Medical Society in Highland, April 2.

Dr. Florimond J. LeBlanc, addressed the McDonagh Society for Clinical Research, April 16, on "Oxidation and Reduction in Colloidal Chemistry."

Dr. George Halperin addressed the Jewish Physicians Fellowship Club of Chicago, April 12, on "Educational Trends in the U. S. S. R."

Dr. David O. N. Lindberg, Decatur, discussed "The Mantoux Test: Interpretation in Infection and Disease" before the Chicago Tuberculosis Society, April 15.

Dr. Hans H. F. Reese, Madison, Wis., addressed the Chicago Neurological Society, April 15 among others, on "Insulin Shock Therapy of Schizophrenia."

At a meeting of the Chicago Pathological Society, April 12, Dr. Dallas B. Phemister spoke, among others, on "Composition of Gallstones Formed in the Common Duct."

Dr. Gaius E. Harmon, epidemiologist with the Chicago board of health, has resigned to accept a similar position with the Detroit Department of Health.

Roentgenographic examination in obstetrics was discussed before the Chicago Gynecological Society, April 16, by Drs. Robert P. Ball and Howard C. Moloy, New York, and Paul C. Hodges and Adolph Hartung, Chicago.

The Chicago Orthopaedic Society was addressed, April 9, by Drs. Harry E. Thompson, Tucson, Ariz., on "Chronic Atrophic Arthritis," and Sumner L. S. Koch, "Infections of the Hand in a General Hospital."

Dr. Arno B. Luckhardt, professor of physiology, School of Medicine, Division of the Biological Sciences, University of Chicago, has been elected a fellow in the International Society of Anesthesia Research in recognition of his discovery of ethylene as an anesthetic.

Chauncey D. Leake, Ph.D., professor of pharmacology, University of California Medical School, discussed "Central Nervous System Depressant Drugs" before the Sangamon County Medical Society, Springfield, April 1.

The Chicago Ophthalmological Society, among



other speakers, was addressed, April 19, by Drs. Theodore E. Walsh on "Some Results of Intranasal Dacryocystotomy in Dacryocystitis" and Raymond Carmody, "Ophthalmoplegia and Exophthalmos as a Complication of Herpes Zoster Ophthalmicus."

The Chicago Gynecological Society was addressed, March 19, among others, by Drs. George C. Finola on "Bone Changes in the Fetus Following the Administration of Dicalcium Phosphate and Viosterol to the Pregnant Mother," and Morris Edward Davis and Sarah A. Pearl, "Biology of the Human Vagina During Pregnancy."

The Peoria City Medical Society was addressed, April 20, in Peoria by Drs. Robert E. Plunkett, Troy, N. Y., general superintendent of tuberculosis hospitals, New York State Department of Health, on "The Role of the Family Physician in the Control of Tuberculosis" and Maxim Pollak, "Results of Tuberculosis Control in Peoria."

Dr. Francis E. Senear, Chicago, will address the Adams County Medical Society, May 10, in Quincy on "Diagnosis and Treatment of Early Syphilis." A symposium on intravenous medication was presented before the society April 12 by Drs. Milton E. Bitter, James F. Merritt, Warren F. Pearce and Walter M. Whitaker, all of Quincy.

The Chicago Urological Society was addressed March 25, among others, by Dr. Harry E. Kasten, Beloit, Wis., on "Metastasis in Hypernephroma." Dr. Homer G. Hamer, Indianapolis, will address the society, April 22, on "Diagnosis, Differential Diagnosis and Treatment of Metastatic Infections of the Kidney" and Dr. Vincent J. O'Connor will discuss the etiology of the subject.

Dr. Anton J. Carlson, professor and head of the department of physiology, School of Medicine, Division of Biological Sciences, University of Chicago, discussed the control of the endocrine glands at Loyola University School of Medicine, April 2. The lecture was the ninth of an annual series established in 1929 by Alpha Omega chapter of Phi Beta Pi medical fraternity in memory of the late Dr. Samuel A. Matthews, who was professor and head of the department of physiology, pharmacology and therapeutics at Loyola.

Dr. E. S. Hamilton, Kankakee, addressed the Kankakee County Medical Society at a special meeting April 2, on "The Future of the Practice of Medicine."

Samuel M. Feinberg will give two lectures on "Allergy" to the classes at Wright Junior College on April 22 and May 5.

Doctor Daniel H. Levinthal was invited to be the guest speaker at the weekly luncheon meeting of the Will-Grundy County Medical Society in Joliet on April 7, 1937. His subject will be "Bone Tumors, With Particular Reference to the Eradication and Immediate Reconstructive Surgery in Benign Lesions."

Dr. R. R. Smith, Managing Officer of the Kankakee State Hospital, was host at a 6:30 o'clock dinner for the members of the Kankakee County Medical Society, April 9. After which, Dr. A. A. Low of Chicago, discussed, "Insulin Shock Therapy in the Treatment of Dementia Praecox."

Doctor Samuel M. Feinberg has been invited to give the evening address at the annual banquet and meeting of St. Joseph County Medical Society at South Bend, Indiana, on May 19. His subject will be "Air-Borne Non-Pathogenic Fungi. A Newly Recognized Menace to Allergic Individuals."

A joint meeting of the Champaign and other constituent counties of the eighth district was addressed on Wednesday night, April 7, by Dr. Winston H. Tucker of the Department of Public Health on some aspects of the Federal Social Security Act to be administered through public health, by Dr. Paul H. Harmon, Superintendent of the Handicapped Children for the State of Illinois on provisions of the Federal Social Security Act for crippled children and by Dr. Harold M. Camp of Monmouth, Illinois, on the Federal Social Security Act for the medical profession.

Dr. Max Thorek addressed the Lafayette Academy of Medicine at Lafayette, Indiana, Tuesday, April 27th. His subject was "Advantages of Electrosurgical Obliteration of the Gallbladder."

Dr. Disraeli Kobak has received from Brussels, Belgium, the diploma and insignia of a Commander of the Royal Order of St. Georges in recognition of his literary work in the field of physical medicine.

## News Notes

—Numerous applications received by the State Department of Public Health from physicians seeking employment as clinicians in venereal disease clinics indicate an erroneous idea concerning the administrative policy with respect to the venereal disease control program in Illinois. The State Department of Public Health does not now operate and does not propose to establish and operate any clinics for the treatment of patients infected with venereal diseases. The Department has begun and proposes to continue and expand the practice of rendering financial aid to local communities for the establishment and operation of venereal disease clinics which are employed as one factor in a satisfactory community program of social hygiene. The administration of the clinics as well as the entire program is a local matter, the State Department of Public Health insisting only that the personnel engaged be well qualified and the program meet reasonably high standards. Otherwise local authorities will have complete jurisdiction over the employment of personnel and the execution of the work.

—The annual meeting of the Iowa and Illinois Central District Medical Association will be held Thursday, May 27, 1937, at the Outing Club, Davenport, Iowa. The following program will be presented, beginning at 3 P. M.

French K. Hansel, M. D., St. Louis, Mo., "Allergy"; W. C. Alvarez, M. D., Rochester, Minn., subject to be announced; Arthur E. Hertzler, M. D., Halstead, Kan., "Surgery of the Thyroid"; W. W. Bauer, M. D., Chicago, "Popular Beliefs That Are Not So."

There will be a dinner at 6 P. M. and election of officers for the ensuing year.

—An evening course in physical therapy began at Northwestern University Medical School, April 5, and will continue until June 15. Further information may be obtained from Dr. John S. Coulter at Northwestern.

—Plans are under way to establish a medical historical museum at Loyola University School of Medicine. A portrait of the late William C. Austin, Ph.D., professor and head of the department of physiologic chemistry at the school, has been presented to the school's library.

—Presbyterian Hospital expended \$846,571.52 in 1936 to care for 11,503 patients in the hos-

pital and 31,879 nonhospital patient visits. An additional \$96,129.53 was expended to maintain the school of nursing and nurses' home, while the cost of free care given to 5,554 part pay and 2,437 free patients was \$183,299.50.

—The Chicago Medical Society held a public meeting on conservation of health, March 17, with Dr. Burt R. Shurly, Detroit, as the guest speaker. Dr. Shurly discussed the periodic health examination, and the following Chicago physicians spoke on special subjects: Drs. Austin A. Hayden, hearing; Nathan S. Davis III, heart; G. Henry Mundt, vision, and Arthur H. Conley, orthopedics.

—Dr. Paul H. Harmon, instructor in orthopedic surgery, University of Chicago, has been appointed director of the crippled children's bureau of the Illinois Department of Public Welfare, with offices in Springfield, effective April 1. The university has granted Dr. Harmon a leave of absence to organize the state's program for crippled children, which will be financed by social security funds. The project will include a census of crippled children; provision for the care of indigent crippled children, and an orthopedic field nursing and follow-up program.

—The first of a series of clinics to be used in venereal disease control was opened in Cairo April 1 by the state health department. Although treatment will be available only to persons unable to pay, a generalized campaign will be centered at the clinic. Financed jointly by the local and state governments, the clinic at Cairo will be under the direct supervision of Dr. Charles L. Weber, city health officer, while a governing board of three citizens and an advisory board of sixteen, representing all civic and professional interests, will determine the policies and direct the program. Blood tests will be made free of charge for any person desiring them. It is expected that eleven clinics will be established throughout the state before July 1. The establishment of these clinics is a part of the state's participation in the national campaign against venereal disease.

—A series of lectures on obstetrics and pediatrics is being offered throughout the state as a part of the national program to improve conditions for mothers and children in rural areas. The project is under the direction of a specially appointed committee on infant and maternal



welfare in cooperation with the state department of public health, the state medical society, the Illinois Academy of Pediatrics and the American Committee on Maternal Welfare. Dr. Harold H. Hill, formerly associate in the department of obstetrics and gynecology, University of Illinois College of Medicine, Chicago, as field consultant, is in charge of arrangements. The series opened March 4 in Lincoln with a program for the DeWitt and Logan county medical societies. Dr. Louis Rudolph discussed the management of obstetric hemorrhage and Dr. Clifford G. Grulee, Evanston, infant feeding and prophylaxis of contagious disease. In Sangamon County the program opened March 11 at Springfield and in McLean County March 18 at Bloomington. Each series will run for six weeks consecutively.

## Deaths

AUGUST ANDERSON, Chicago; Hahnemann Medical College and Hospital, Chicago, 1916; a Fellow, A.M.A.; veteran of the Spanish-American and World wars; aged 55; died, March 14, of organic heart disease.

S. CLAUDE ANDRUS, Rockford, Ill.; Northwestern University Medical School, Chicago, 1897; a Fellow, A.M.A.; aged 64; formerly on the staff of the Rockford Hospital, where he died, January 12, of pneumonia.

JOHN ROSCOE ASH, Brighton, Ill.; Beaumont Hospital Medical College, St. Louis, 1889; member of the Illinois State Medical Society; aged 69; died, March 19, in a hospital at Alton, of pneumonia.

HENRY M. BOIES, Albany, Ill.; Jenner Medical College, Chicago, 1910; member of the Illinois State Medical Society; served during the World War; aged 57; died, February 24, in the Veterans Administration Facility, Hines, of pneumonia.

ESTELLA CLARK CARPENTER, Chicago; Jenner Medical College, Chicago, 1903; member of the Illinois State Medical Society; aged 69; died, January 26, of carcinoma of the intestine and lung.

JAMES E. CUNNINGHAM, Chicago; Northwestern University Medical School, Chicago, 1896; aged 48; died, January 27, in the Veterans Administration Facility, Hines, Ill., of coronary occlusion.

LE ROY H. DAGGETT, Chicago; Jenner Medical College, Chicago, 1900; member of the Illinois State Medical Society; aged 64; died, February 3, in the Highland Park (Ill.) Hospital, of pneumonia.

WILLIAM H. DEMPSEY, Alton Ill.; Missouri Medical College, St. Louis, 1898; a Fellow, A.M.A.; aged 65; died, January 29, of bronchopneumonia.

WILLIAM C. DIXON, Greenville, Ill.; Beaumont Hospital Medical College, St. Louis, 1895; member of the Illinois State Medical Society; president of the

Bond County Medical Society and past president of the Vermilion County Medical Society; formerly health officer of Danville; aged 67; died, February 12, in the Barnes Hospital, St. Louis.

JOHN FAHRNER, SR., Joliet, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1882; aged 82; died, Dec. 29, 1936.

ANDREW GRASSAU, Caledonia, Ill.; Rush Medical College, Chicago, 1896; aged 68; died, February 10, in a hospital at Fort Myers, Fla.

H. NELSON HEFLIN, Kewanee, Ill.; Minneapolis College of Physicians and Surgeons, 1895; a Fellow, A.M.A.; formerly health officer of Kewanee; on the staffs of the Kewanee Public Hospital and St. Francis Hospital; aged 72; died, January 15.

THOMAS HUGHES, Chicago; Northwestern University Medical School, Chicago, 1892; a Fellow, A.M.A.; aged 70; died, February 5, of bronchopneumonia and diabetes mellitus.

CHARLES L. JONES, Noble, Ill.; Barnes Medical College, St. Louis, 1903; aged 62; died, February 2, at the Olney (Ill.) Sanitarium, of cardiovascular renal disease.

ALBERT A. LOWENTHAL, Chicago; College of Physicians and Surgeons of Chicago, 1895; at one time adjunct professor on mental disease at his alma mater; formerly on the staff of the Cook County Hospital; aged 63; died, March 19, of coronary occlusion and diabetes mellitus.

NORMAN BUELL MARSHALL, Chicago; Jefferson Medical College of Philadelphia, 1883; aged 76; died, February 26, of carcinoma of the ear.

DELMAR IVAN MARTIN, Springfield, Ill.; Northwestern University Medical School, Chicago, 1929; member of the Illinois State Medical Society; president of the county tuberculosis board; served during the World War; aged 35; died, February 21, in St. John's Hospital, of pneumonia.

MORRIS MEYEROVITZ, Chicago; College of Physicians and Surgeons of Chicago, 1890; formerly member of the Illinois State Board of Health and the Chicago Plan Commission; at one time on the staff of the Cook County Hospital; aged 76; died, March 3, of coronary thrombosis and arteriosclerosis.

THOR CHRISTIAN ROTHSTEIN, Chicago; Karolinska Mediko-Kirurgiska Institutet, Stockholm, Sweden, 1897; professor emeritus of neurology, Rush Medical College; aged 72; on the consulting staff of the Augustana Hospital and on the staff of the Presbyterian Hospital, where he died, February 19, of arteriosclerosis and coronary thrombosis.

FOREST CLYDE VAN HOOK, Mount Pulaski, Ill.; Northwestern University Medical School, Chicago, 1913; for several years a member and president of the board of education; aged 49; died, January 29, in Tucson, Ariz., of diabetes mellitus.

SILAS WILKIN WEIR, West Union, Ill.; St. Louis College of Physicians and Surgeons, 1906; a Fellow, A.M.A.; aged 57; died, January 30, in the Union Hospital, Terre Haute, Ind., of acute dilatation of the heart.

# DIARRHEA

## "the commonest ailment of infants in the summer months"

(HOLT AND McINTOSH: HOLT'S DISEASES OF INFANCY AND CHILDHOOD, 1933)

One of the outstanding features of DEXTRI-MALTOSE is that it is almost unanimously preferred as the carbohydrate in the management of infantile diarrhea.

In diarrhea, "The sugar is added gradually, some sugar other than milk conditions admit, being used, preferably dextrin sugar or cane sugar, in bottle-fed infants."—H. E. Small: *Diarrhoea in bottle-fed infants and maltose*.—J. Maine M. A. 12:152-158, Jan. 1932.

In diarrhea, "Carbohydrates, in the form of dextrin-maltose, well cooked cereals or rice, usually can be handled without trouble."—B. B. Jones: *A discussion of some of the commoner types of infantile diarrhea, and the principles of the diets used in their treatment*.—Monthly, 56: 411, 1932.

"The most desirable sugar is dextrin-maltose because of all the sugars maltose is least apt to cause."—A. J. Blau: *The use of protein milk*.—Monthly, 56: 411, 1932.

Regarding the treatment of diarrhea, "In our experience, the most satisfactory carbohydrate for routine use is Mead's dextrin-maltose No. 1."—F. R. Taylor: "Summer Complaints," *Southern Med. & Surg.*, pp. 555-559, August, 1927.

In cases of diarrhea, "For the first day or so no sugar should be added to the milk. If the bowel movements improve carbohydrates may be added. This should be the one that is most easily assimilated, so dextrin-maltose is the carbohydrate of choice."—W. H. McCaslan: *Summer diarrheas in infants and young children*. J. M. A. Alabama, 1:278-282, Jan., 1932.

Concerning the treatment of diarrhea, "If the weight remains stationary, it is an indication that loss of substance is occurring through the stools, mostly in the form of alkaline salts. To equalize this loss of substance, the diet must be increased, but in such a way as to avoid causing fermentation. This may be done by adding dextrin-maltose preparations of protein to the food, increasing the calories until the infant is taking 160 calories per kilo. of body weight."—H. L. Ratnoff: *Nutritional disturbances*. Arch. Pediat., 41:771 Nov., 1924.

### SERIOUSNESS OF DIARRHEA

There is a widespread opinion that, thanks to improved sanitation, infantile diarrhea is no longer of serious aspect. But Holt and McIntosh declare that diarrhea "is still a problem of the foremost importance, producing a number of deaths each year. . . ." Because dehydration is so often an insidious development even in mild cases, prompt and effective treatment is vital. Little states (Canad. Med. A. J. 13: 803, 1923), "There are cases on record where death has taken place within 24 hours of the time of onset of the first symptoms."

There is any tendency to sugar fermentation use a preparation with a high dextrin and relatively low maltose content, as Mead's dextrin-maltose. "If it is desired to feed an unusually large amount of sugar to a baby, it is well to use a maltose-dextrin preparation, as in this way there is less danger of bringing about sugar fermentation than if lactose were used."—L. W. Hill: *Practical Infant Feeding*. W. B. Saunders Co., Phila., 1922, p. 206.

"The young baby, usually one-third milk and two-thirds skimmed at first, and a half ounce of Dextrin-Maltose as the carbohydrate. We prefer Dextrin-Maltose as the carbohydrate most easily digested. . . . Preparations containing the more maltose are more rapidly absorbed, but on the other hand, are more liable to produce diarrhea. . . . Lactose which was very popular at one time, is never used in our work. The consensus of opinion seems to be that milk sugar is often a source of indigestion in normal infants and the primary cause of fermentative dyspepsias in infants."—J. H. Reading, Jr.: *Artificial Infant Feeding*. W. B. Saunders Co., Phila., 1923.

"Protein milk may be continued for several weeks when a gradual transition to a whole milk or evaporated milk formula, which will supply about one and one-half to two ounces of whole milk to every pound of body weight, is reached. This should finally have the addition of dextrin-maltose to the formula. . . . The amount of dextrin-maltose should amount to five to seven per cent."—R. A. Strong: *Summer diarrheas in infancy and early childhood*. Arch. Pediat., 47:344-354, June, 1930.

"In cases of malnutrition and indigestion, the appetite improves rapidly, and the stools soon become normal in appearance. By this I refer to the proper proportion of dextrin and maltose. When there is a tendency to looseness, I have used the preparation known as 'dextrin-maltose' for the management of infants."—M. Ladd: *Further experience with dextrin-maltose*.—J. Maine M. A. 12:152-158, Jan. 1932.

"It should be remembered that a high percentage of lactose may be required if it is better to use Mead's No. 1. . . . The percentage of sugar by Mead's No. 1 is slightly in excess of that of dextrin-maltose, but the possibility of where the maltose is only slightly in excess of dextrin, thus diminishing the possibility of excessive fermentation."—W. J. Pearson: *Protein milk*.—Arch. Pediat., 42:743-760, Nov., 1925.

"In the management of diarrhea, 'Dextrin-maltose' preparations are preferred, for they do not ferment readily, are rapidly absorbed and leave very little residue for fermentation."—V. A. Blenkle: *Protein milk*.—Arch. Pediat., 42:743-760, Nov., 1925.

"After the preliminary short period of starvation, protein milk should be used. . . . When the diarrhea has been sufficiently checked, dextrin-maltose may be added and gradually increased until from 4 to 6 tablespoons are being used."—V. L. Denney: *Acute nutritional disturbances of infancy*. Univ. West. Ontario M. J., 2:132-137, April, 1932.

"I begin to add carbohydrates slowly, by replacing 1/4 ounce Casec every two days with 1/4 ounce of Dextrin-Maltose, preferably Dextrin-Maltose Number one. As a rule, this is tolerated. When one ounce of Dextrin-Maltose is used, the Casec, of course, should be discontinued."—J. W. Reed: *The etiology and treatment of infantile diarrhea*.—Arch. Pediat., 42:743-760, Nov., 1925.

"When sugar causes diarrhoea one can change the form of it. Mead's Dextrin-Maltose, in small doses is more quickly absorbed and so superior to castor [cane] sugar. Lactose is expensive and seems not to be better than castor sugar."—H. B. Gladstone: *Infant Feeding and Nutrition*.—J. Maine M. A. 12:152-158, Jan. 1932.

"Milk-sugar, which has been so extensively used in the past, should never be used where there is any digestive disturbance. It is not as easily digested as either cane-sugar (granulated sugar) or dextrin-maltose. The latter is the best of all for infants to use, especially if there is any tendency to looseness of the bowels."—A. Brown: *The Nutrition of Infants and Children*. F. D. Goodchild Co., Toronto, 1923, p. 120.

For cases of fermentative diarrhea, "the ideal plan of treatment would be to give a food which is low in sugar (the food which that group of organisms thrive on) and high in protein. Calcium caseinate milk accomplishes this purpose. In our series of cases, we found it was necessary to use the casein calcium from 5-8 days; we then stopped it and added dextrin-maltose to the formula."—A. G. DeSanctis and L. V. Paider: *The value of calcium caseinate milk in fermentative diarrhea*. Arch. Pediat., 48:22, 1931.

Just as DEXTRI-MALTOSE is a carbohydrate modifier of choice, so is CASEC (calcium caseinate) an accepted protein modifier. Casec is of special value for (1) colic and loose green stools in breast-fed infants, (2) fermentative diarrhea in bottle-fed infants, (3) prematures, (4) marasmus, (5) celiac disease.

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## BUYERS INDEX

### ABDOMINAL SUPPORTERS

Storm, Katherine L., M. D., 1701 Diamond St., Philadelphia, Pa. .... 26

### FOODS

Coca-Cola Co., Atlanta, Ga. ....  
 Corn Products Refining Co., New York City. .... 4  
 R. B. Davis Co., Hoboken, N. J. .... 34  
 H. J. Heinz, Pittsburgh. .... 16  
 Knox Gelatine Laboratories, Johnstown, N. Y. ....  
 Mead Johnson & Co., Evansville, Ind. .... 19  
 Ralston Purina Co., St. Louis, Mo. .... 13  
 S. M. A. Corporation, Cleveland. .... 2  
 The Wander Company, 180 N. Michigan Ave., Chicago. .... 11

### FINANCIAL AND INSURANCE

Medical Protective Co., Fort Wayne, Ind. .... 8  
 Physicians Casualty Co., Omaha, Neb. .... 31

### HOSPITALS

Stokes Hospital, Louisville, Ky. .... 31

### INDUSTRIAL HYGIENE

Dr. C. O. Sappington, Chicago. .... 32

### PHARMACEUTICALS

American Agency, French Vichy, Brooklyn, N. Y. .... 27  
 American Can Co., 230 Park Ave., New York City. .... 3  
 Arlington Chemical Co., Yonkers, N. Y. .... 29  
 Armour & Co., Chicago. ....  
 Bovine Company, Chicago. .... 20  
 Bristol-Myers Co., New York. .... 22  
 Carnrick, G. W., Co., 411 Canal St., New York City. .... 17  
 Carr Drug Co., Muncie, Ind. .... 28  
 Chappel Laboratories, Rockford, Ill. .... 30  
 Ciba Company, Cedar and Washington St., New York City. ....  
 Denver Chemical Co. .... 24  
 Gold Pharmacal Co., New York City. .... 31  
 Harrower Laboratory .... 33  
 Hoffman-LaRoche, Inc., Nutley, N. J. .... 7  
 Hynson, Westcott & Dunning, Charles and Chase Sts., Baltimore .... 31  
 Lilly, Eli & Co., Indianapolis, Ind. .... 18  
 Merck & Co., Rahway, N. J. .... 14

Merrell, Wm. S., Co., Cincinnati. ....  
 Morris, Philip, & Co., 19 Fifth Ave., New York. .... 8  
 Parke, Davis & Co., Detroit, Mich. .... 5  
 Petrolagar Laboratories, 8134 McCormick Blvd., Chicago. ....  
 Rare Chemicals, Nepera Park, N. Y. .... 9  
 Reed & Carnrick, Jersey City, N. J. ....  
 Schering & Glatz, Inc., New York City. ....  
 G. D. Searle & Co., 4737 Ravenswood Ave., Chicago. .... 12  
 Sharp & Dohme, 41 John St., New York City. .... 17  
 E. R. Squibb & Sons, New York. .... 35  
 Frederick Stearns & Co. ....  
 Tilden Company, New Lehanon, N. Y. .... 28  
 U. S. Standard Products Co., Woodworth, Wis. .... 26  
 Wm. R. Warner & Co., 113 W. 118th St., New York City. .... 10, 15  
 Winthrop Chemical Co., 170 Varick St., New York City. .... 6

### SANATORIA AND SANITARIA

Edward Sanatorium, Naperville, Ill. .... 32  
 Elmlawn (Wilgus) Sanitarium, Rockford, Ill. .... 25  
 Kenilworth Sanitarium, Kenilworth, Ill. .... 25  
 Michell Farm Sanitarium, Peoria, Ill. .... 36  
 Milwaukee Sanitarium, Wauwatosa, Wis. .... Front Cover  
 Norbury Sanitarium, Jacksonville, Ill. .... 25  
 North Shore Health Resort, Winnetka, Ill. .... 32  
 Rogers Memorial Sanitarium, Oconomowoc, Wis. .... 36  
 Waukesha Springs Sanitarium, Waukesha, Wis. .... 25  
 Weirick's Sanitarium, Elgin, Ill. .... 31

### RADIUM

Physicians Radium Assn., 55 E. Washington St., Chicago. .... 31  
 Radium and Radon Corp., 25 E. Washington St., Chicago. .... 33

### SCHOOLS

Pogue School, Weaton, Ill. ....

### SURGERY INSTRUCTION

A. V. Partipiloh, M. D., 1950 S. Ogden Ave. .... 26

### SURGICAL SUPPLIES

W. A. Baum Co., New York. .... 26  
 General Electric X-ray Corp., 2021 Jackson Blvd., Chicago. .... 23



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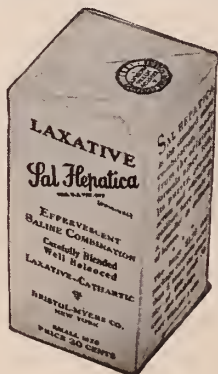
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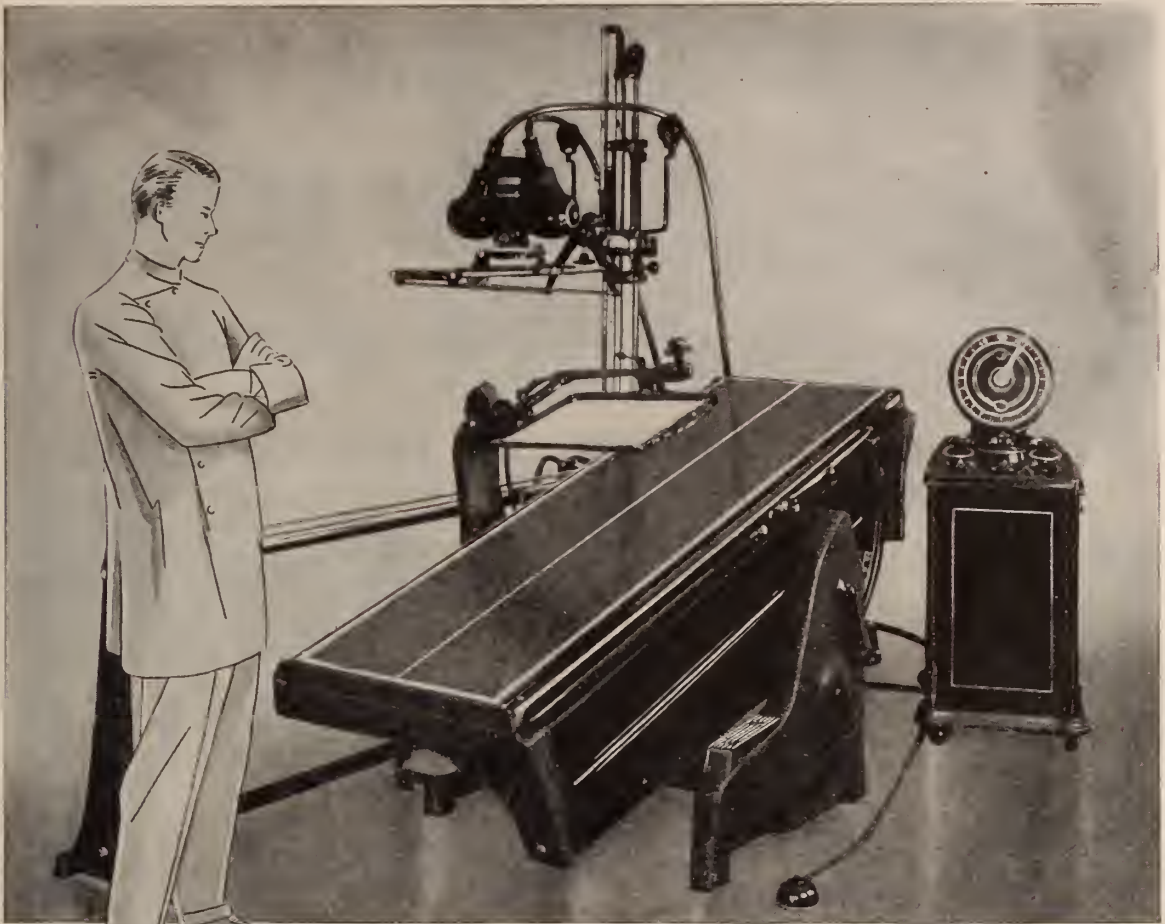
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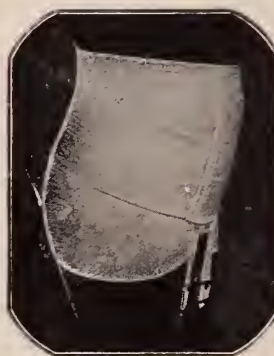
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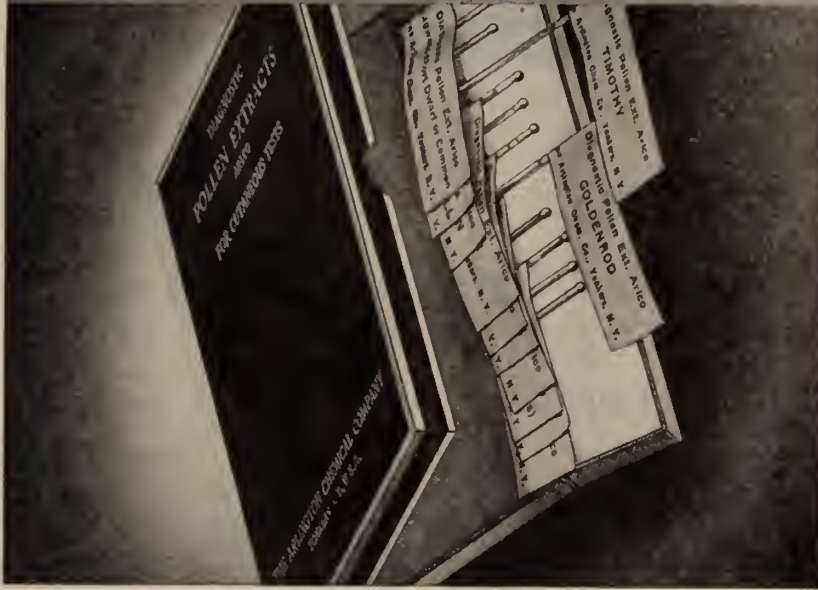
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## Book Reviews

**THE THYROID AND ITS DISEASES.** By J. H. Means, M. D., Philadelphia, Montreal and London. J. B. Lippincott Company. 1937.

This work is based in large measure on the experience gained in the Thyroid Clinic of the Massachusetts General Hospital. The work is intended to be, in a measure, a text book but is in no sense an encyclopedic treatise on thyroid diseases. It is rather an account of

a personal experience of a considerable group of workers in a single thyroid clinic.

**A MANUAL OF OPERATING ROOM PROCEDURES.** By Almira W. Hoppe and Lucile M. Halverson. Minneapolis. The University of Minnesota Press. 1937. Price \$2.00.

In this work the authors have emphasized the importance of the planned operation in which every detail of a procedure has been carefully and thoughtfully worked out. It is in essence a guide to the efficiency conduct of an operation from the standpoint of a surgical nurse.



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SYNOPSIS OF PEDIATRICS. By John Zahrosky, M. D., Assisted by T. S. Zahrosky, M. D. Second Edition. St. Louis, C. V. Mosby Company. 1937. Price \$4.00.

In this revision the section on diagnosis and therapeutics have been brought up-to-date. Several paragraphs have been rewritten, many new sections have been added. One new chapter—Diseases of the Eyes and Ears make this work more comprehensive. Several color plates have been added.

DIABETES A MODERN MANUAL. By Anthony M. Sindoni, Jr., M. D., New York and London. Whittlesey House. 1937. Price \$2.00.

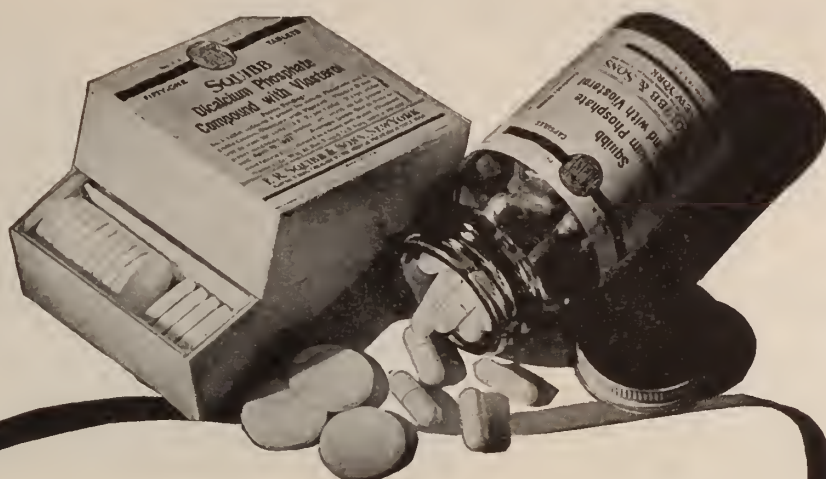
This work is divided into three sections; questions asked the physician by the person who has diabetes, and the answers; what to know; and what to do. An extensive discussion of diet for the diabetic, with suggested menus, is included.

MEDICAL NEUROLOGY. By Irvin S. Koll, M. D., with 92 Text Illustrations and 6 Color Plates. St. Louis. C. V. Mosby Company. 1937. Price \$5.00.

In this work the author presents the subject of urology in such a manner as to be of practical value to the general physician and an aid to the medical student. Most of the subject matter in this work represents personal experience.

## EVALUATION OF ROENTGEN DIAGNOSIS OF EARLY CARCINOMA OF BREAST

Jacob Gershon-Cohen and A. E. Colcher, Philadelphia (*Journal A. M. A.*, March 13, 1937), believe that the roentgenographic examination of the breast is a more useful diagnostic procedure than is generally appreciated. A diagnostic accuracy better than that resulting from macroscopic inspection of sections can be attained. A remarkably high percentage of roentgen diagnoses is proved to be correct by histologic studies, and this can be increased if the examination is more seriously and uniformly emphasized. Early malignant changes can be very frequently determined, especially in the fat and postclimacteric breast. Otherwise there are many limitations to the roentgen study of the pathologic breast which probably could be materially reduced if resort were made to serial examinations. If periodic examinations of normal breasts were carried out in women more than 25 years of age, the authors venture to say that a much more effective campaign could be therapeutically waged in carcinoma of the mammary gland because of the diagnosis of early malignant signs so obtainable. The examination can be done easily with so little expense that it is entirely practicable from these standpoints. It is even possible that the therapeutic effect on breasts of many endocrine substances might be revealed more graphically by the roentgen examination than by any other practical clinical method now available, and this suggestion warrants further investigation.



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## CONTENTS:

Editorials (For Titles See Extended Table of Contents) ..... 457

### ORIGINAL ARTICLES

Endocrine Progress re Hypertension and Diabetes Mellitus. *James H. Hutton, M. D., Chicago*... 469  
Neurogenic Sarcoma. *I. Edward Bishkow, M. D., Chicago* ..... 472  
Crisis in Addison's Disease Simulating Coronary Thrombosis. *Herbert A. Sacks, M. D., Chicago* 475  
Vitamin F. Ointments. *M. L. Weinstein, M. D., and Kathryn Glennon, Ph. G., Chicago*..... 477  
Combined Full-term Extra and Intra Uterine Pregnancy. *Flint Bondurant, M. D., Cairo, Ill.*..... 480  
Epileptic Seizures re Prostatitis. *C. Otis Ritch, M. D., Chicago*..... 481

Indications for Gastroscopy. *Levin Ormayer, M. D., Chicago* ..... 452  
Problems of Pneumothorax Therapy. *Jacob J. Mendelsohn, M. D., Chicago*..... 484  
Pernicious Anemia Simulating Leukemia. *Albert Van der Kloot, M. D., Chicago*..... 487  
A Pterygium Operation. *Clark W. Hawley, M. D., Chicago* ..... 489  
Solitary Cyst of the Kidney. *Charles E. Boylan, M. D., Chicago*..... 490  
Treatment of Empyema Complicating Artificial Pneumothorax. *Jerome R. Head, M. D., Chicago* 493  
Visceral Pain. *F. J. Lesemann, M. D., Chicago*.. 495  
Helpful Points in Gynecological Diagnosis. *Otto S. Krebs, M. D., St. Louis, Mo.*..... 501

(Continued on page 8)

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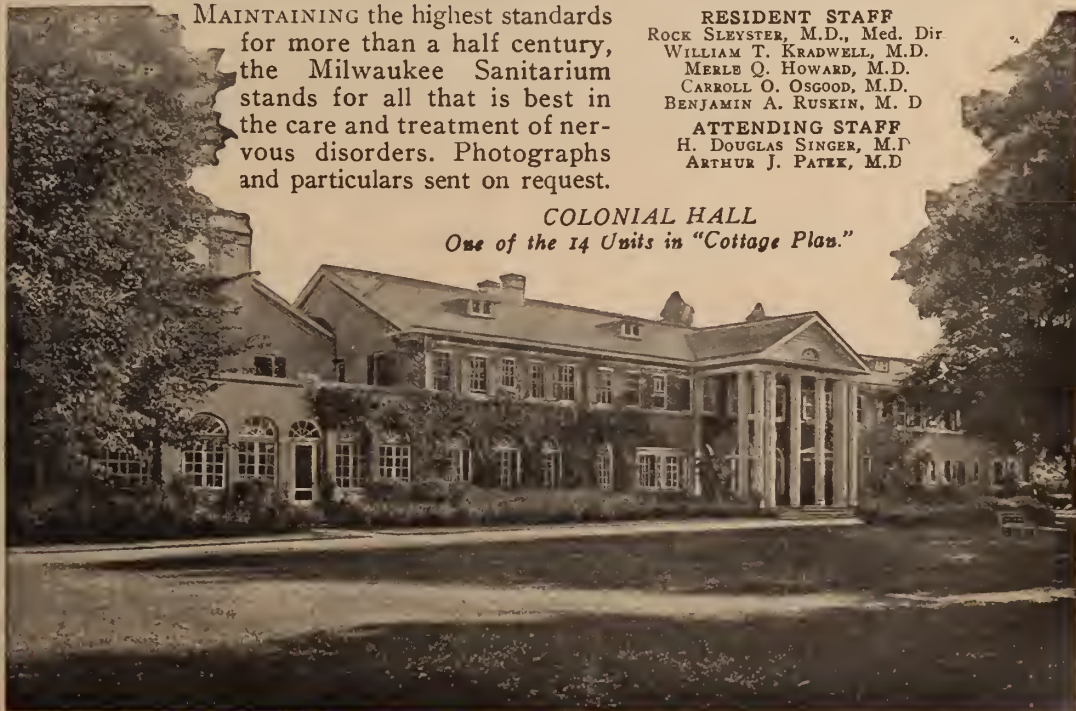
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## IV. VITAMIN B<sub>1</sub>

• The multiple nature of vitamin B has been definitely established by intensive research within the past decade. Considerable quantitative information is now available concerning the requirements of certain species of animals for the various factors contained in the vitamin B complex. At the present time, however, the anti-neuritic vitamin B<sub>1</sub> is the only one of these factors for which the minimum requirement for man can be postulated.

Beriberi-preventing diets of Chinese coolies and natives of Java have been estimated to contain 200 International units of vitamin B<sub>1</sub> (1). Practical use is made of knowledge such as this in the Philippines, where the Bureau of Science, in a successful effort to combat beriberi, dispenses tikitiki (vitamin B<sub>1</sub> concentrate from rice polishings) containing approximately 200 International units of vitamin B<sub>1</sub> per daily dose.

It is generally agreed that the absolute requirement for this factor may be variable, depending upon such factors as size and caloric intake of the individual. However, equations have been derived which take into consideration some of these variables and are useful in estimating the adult vitamin B<sub>1</sub> requirement (2).

Application of these equations indicate that approximately 225 International units of vitamin B<sub>1</sub> per day are required for the average American adult. The average daily infant requirement has been estimated to be

50 International units, increasing to 200 units at the time of adolescence (1). The League of Nations Technical Commission recommends a daily intake of over 150 International units for pregnant and lactating women (3).

While it may be possible to estimate the daily intake of vitamin B<sub>1</sub> which will prevent clinical beriberi, it is not yet possible to state the minimum amount of the vitamin which, when imposed on an otherwise adequate diet, will promote optimum nutrition. There is increasing belief that some of the vague disorders, noted clinically, may be in reality manifestations of suboptimal vitamin B<sub>1</sub> intake (4).

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(1) 1934-35. Am. Pub. Health Assn. Year Book. Page 70

(2) The Vitamin B Requirements of Man. G. R. Cowgill Yale University Press. New Haven. 1935

(3) 1936. Nutr. Abstr. and Rev. 5, 855

(4) a. 1936. J. Am. Med. Assn. 106, 261  
b. 1935. Ibid. 105, 1580

(5) a. 1932. Ind. Eng. Chem. 24, 457  
b. 1932. J. Nutrition 5, 307  
c. 1934. Ibid. 8, 449  
d. 1935. Ibid. 11, 383

(6) 1934. U.S. Pub. Health Rpts. 49, 754

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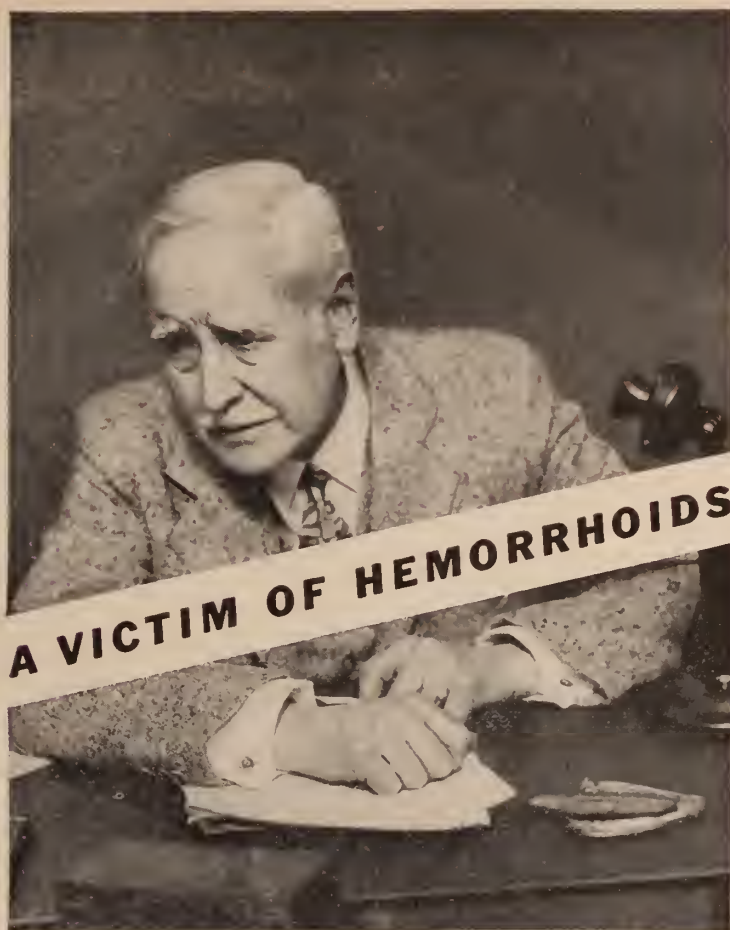
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## CONTENTS—Continued

### ORIGINAL ARTICLES

Cardiac Review for 1936. Nathan Flaxman, M. D., Chicago	509
True Vaginal Hernia. Case Report. James P. McGuire, M. D., and Philip R. McGuire, M. D., Chicago	526
Cryptitis. Charles J. Drueck, M. D., Chicago	528
Sudden Death from Natural Causes in Adults. Edwin F. Hirsch, M. D., Chicago	531

### EDITORIALS

Report of American Foundation	457
Death of Venerable Practitioner	462
The 1937 Annual Meeting	463
Testimonial Dinner to Dr. Charles B. Reed	464
Medical Economics. E. S. Hamilton	465

### CORRESPONDENCE

Diphtheria Immunization. Frank J. Jirka	466
Wanted. Totally Deaf-Blind Child. H. S. Hulbert	467
Spinal Puncture Easy. F. T. Grenner	467
Educational Committee Report	467
American Board of Surgery	468

### SOCIETY PROCEEDINGS

Henry County	537
Marriages	537
Personals	537
News Notes	538
Deaths	540

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# ILLINOIS MEDICAL JOURNAL

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## Editorials

### REPORT OF THE AMERICAN FOUNDATION

The report of The American Foundation Studies in Government Surveying the Cost of Medical Care is now well distributed throughout the United States.

Even to skim lightly through the almost 1,500 pages of the two beautiful volumes containing this report may seem an onerous chore to many an overworked general practitioner. The average doctor is usually too busy attending to his business to spare time, strength or postage to discover what the laity thinks about him and his profession and the way in which it is run.

But this is a day of lay espionage of the professions, especially of the medical profession. The American Foundation Studies in Government (a group of patriotic and high-minded persons that calls this report "American Medicine or Expert Testimony Out of Court") was undoubtedly motivated by the sincerest and most serious of aspirations when it set out to garner these sheaves of information.

In the group of a dozen American citizens of prestige, headed by Curtis Bok as chairman, there was one physician, a university associate professor; one president of the Board of Trustees of a New York infirmary for women and children; and a famous scientist who is director of an international laboratory of physics. Which is a much better break as to the professional understanding of an investigative personnel than medicine usually gets. Furthermore, the American Foundation, at the outset, asserted that it was out to *get information*, not to *give propaganda*. With this shaking of hands and smoking of the Calumet the program proceeded. Publication of this report has been achieved at great expense. To the casual eye the entire proceeding appears a great deal like rummaging through the attic to see what is in all the trunks and boxes, and then walking off and leaving *les reclaims* spread out on the floor. It is impossible not to feel, when regarding this tremendous amount of opinion that has thus been strewn broadcast, as to whether *everything* was



turned out, or the most important barrels and boxes possibly overlooked!

In his foreword Mr. Bok, the chairman, remarked in part: "In common with a good many of our countrymen, we (The American Foundation) contemplated the changing forms around us, wondering if it were discoverable, in measurable terms, how far and in what manner a government's capacity for service to its citizens is conditioned by its form."

The average alert doctor may be excused if he asks then and there, "*When did the government begin to practice medicine?*"

Mr. Bok proceeds (again in part): "All our contemplation of the changing world about us leads to the conclusion that the thing that is measurable, and the only thing that is really important, is the nature and degree of the service, *in many fields*, which government, whatever its form, attempts to and does render to its citizens. If it could first be established what a government should or could do for its citizens, then it would become much simpler to determine *under what form of government* this could most efficiently be done. Laying aside, therefore, speculation upon the significance of forms, we set ourselves the task of investigating the degree to which government may wisely serve its citizens."

To the picayunish auditor that statement in itself might seem to smack of a socialistic investigation of life, since it seems to be far less interested in scientific progress than in governmental form. Further it would assume to arrogate to the Government the prerogative of medical practice. Here is an excerpt from the introduction by the physician on the committee, Dr. Truman G. Schnabel of the faculty of the University of Pennsylvania.

"In sending our inquiry in the first instance there was no assumption that doctors and doctors alone could solve the problem. *Social scientists, economists, government administrators are in a position to estimate the needs of the population.* They have certainly a contribution to make and with this report as a basis we contemplate extending this inquiry to include it."

And again Dr. Schnabel: "That there is a general economic problem in the fact that a large number of the population is without *adequate anything* has been somewhat lost sight of by some of those whose particular interest

is an adequate medical care. They have given an unduly specific focus to a problem that is general."

We agree here with Dr. Schnabel. A truthful and honest straw vote would reveal far more persons in the United States in need of adequate food, clothing and shelter than are suffering from lack of "adequate medical care." Doctors are more generous than grocers.

In its issue of April 10, 1937, the Journal of the American Medical Association dealt most diplomatically with the report. But even so, the review of the report was constrained to say in part: "The question concerning the *socialization of scientific aids to diagnosis* suggests that there is already among patients and physicians alike over-emphasis on laboratory procedure and that making tests easily available will increase this over-emphasis; *that extending the facilities of state laboratories will be an opening wedge for state medicine*; that the policy will not be fair to private laboratories and technicians, and that the work will not be well done and will therefore not improve the quality of medical care. . . State aid for the general care of indigent patients is now available in twenty states to voluntary hospitals. . . Another correspondent thinks that health is more important to the human being than the services given by the other professions or by industry. *He does not see why medical men should be forced to give their services under government supervision when the men who rent insanitary tenements and the men who supply food and clothing are not put under similar control.*"

In fact, this last phrase is on the lips of many a doctor who replied to the questionnaire. One staunch soul responded: "State medicine would be 90% state and 10% medicine."

This same editorial takes issue with the report's conclusion that "There is a growing tendency in both the profession and the public to question why it is commendable to insure against the cost of hospital care but unethical to insure against the cost of medical care."

A sidelight on the psychology of the answers may be turned on when it is realized that of the physicians in the United States about 68% are in general practice, some 16% specialists, and the remaining 16% in special attention. Yet classifications of the answers shows some 36% of the correspondents quoted to be in general medicine and pediatrics, some 38% surgeons,

general and special, and 26% engaged in the practice of other specialties. Which changes the perspective on the report. There were in all some 2,200 men replying to the questionnaire, and nearly every one of them wrote at least two letters! *It is not a mirror of opinion of the general practitioner.*

As a matter of fact, by far the majority of those who entered into a discussion of the "*doctor-patient*" relation were either on the faculties of universities as deans or teachers or were specialists and far from the point of view of the general practitioner, or the patient.

There are almost 600 subjects propounded for discussion in the book, and all are more or less discussed. One of the strongest protagonists for the report, William G. Lennox of the Harvard University Medical School, reviewing the book in the "New York Herald-Tribune," admits "The bulk of the discussion explores the possibilities of cheaper and better medical care for the self-supporting middle classes." And again, "Will the American medical profession construct a working program which it will support and which will meet the changing needs of the times? *If not, must government take the lead?*"

Mrs. Ogden Reid, vice-president of the "New York Herald Tribune," is one of the members of the governing committee of the American Foundation. Could this have influenced that reviewer?

One of the vital questions in the book is the feasibility of the installation of a Federal Department of Health.

This, of course, has long been a moot issue. If there were a Secretary of Health for whom would he function? For the politicians who elected the President who would have appointed him? Or for the interests of the profession that he is sworn to defend?

During the Harding regime this idea was much bruited about. For lack of interest, *principally on the part of the medical profession*, it was consigned to oblivion.

The report of the foundation certainly tried to give the situation of medical economics and the practice of medicine a thorough raking up.

Questions presented in the questionnaire included these rough divisions: 1. Availability of medical care; 2. the objective and the responsibility of medical care; 3. proper point of governmental contact; 4. payment per capita capacity; 5. medical education (a) scope of curricu-

lum, (b) limitation of students; 6. revolution or evolution in the system of medical education and practice; 7. specialization; 8. group practice; 9. hospitalization and its relation to medical care; 10. health insurance—voluntary or compulsory; 11. hospital insurance; 12. group practice; 13. contract practice; 14. public health organization; 15. veterans' administration; 16. experimentation—community, county and state and national plans; 17. *state medicine*; 18. limited state medicine and private practice.

True, the report makes no findings, draws no conclusions. It sets forth merely a resumé and an abridgement of the replies it had received to its widespread but not blanket "straw vote." Were the medical profession not assured that the questionnaire was undertaken entirely without bias it would be hard to keep from creeping into the mind remembrance of the Shakespearian comment—"Me-thinks the lady doth protest too much." Certain it is that the report, when placed upon the desks of many a medical man, will make him feel like the small boy set loose in a candy shop of size and consequence. This report will be the first information many a medical man will have had that there are so many things in doubt or could be in doubt as to the feasibility of medical practice.

Esther Everett Lape, the able member in charge of the questionnaire, followed up the report by a resumé of it released to various publications and in which at the outset she remarked:

"The report makes no recommendations; but in quotations from thousands of singularly sincere and spontaneous statements it analyzes profoundly and without reserve the *whole* structure of American medicine, presenting the whole picture, including, as one doctor puts it, the back of the house as well as the front. *Many of the questions raised have immediate interest for the layman.* The questions are *rather discussed than answered.* Or rather for each question there are various answers. With the alternatives before him, the reader can weigh and choose."

In the above paragraph the italics are ours. It is odd to the mind of this editor that, since there is such a *positive inadequacy* of food, shelter and clothing among our millions of population, The American Foundation *should have chosen the profession of medicine* rather than the dairy, or the bakery, or the canning, or the packing, or the shoe, or building industry to "point the moral to adorn the tale."



True, there was a group of 134 medical men associated in a "Medical Advisory Committee" for this report. True, they are all sincere and, in many instances, *eminent men*. There were, however, a considerable proportion of them admittedly "revolutionary" in their attitude toward medicine, and of this group more than one is rather inclined to smile with socialism in medicine as vested in practice under the aegis of "State."

This review, sent out by the committee and for general publication is very honest in its report of the findings of the physicians. For example, interesting citations from this review include:

"1. Better medicine, say the doctors, is more important than better distribution and lower costs. 2. The section on medical education concludes with a discussion of the present state licensing laws. The desirability of higher and uniform standards for licensure is set forth with a great deal of conviction. The present licensing provisions are rather generally characterized as too uneven and too broad. One group would recommend federal licensure—if constitutional obstacles could be surmounted. One group would have provisional licensure, making it necessary for practitioners to take re-examinations or otherwise demonstrate every five years or so that they have developed their ability and are competent in the practice of a rapidly developing science. . . There is discussion of the practicability and value of having in every state a "basic science law" which would at least require every kind of practitioner of the healing art, whatever his cult, to demonstrate a certain amount of knowledge of the human body before permitting him to practice his particular brand of therapy. 3. The reply to the question as to whether there are too many specialists would seem to be: there are too many poor specialists and not enough good ones. 4. The focal points in good group organization are stressed—clarity in financial arrangements; co-operation among the doctors within and without the group; the presence of an "integrator"; flexible spirit and procedure, periodic review and professional analysis of the group work. 5. The question is raised whether the closer organization of hospital staffs and development of their group functioning and the drawing in of more practitioners into connection with hospital work may not mean that the real development of the future will be the hospital

group rather than the independent group organization or the "commercial" group of the present. 6. This chapter, called "The Place of the Hospital," refers to the progressive development by which the hospital has become the center of both medical practice and medical education. . . Finally, the place of the hospital in medical education is indicated, and—potentially at least—in medical research. 7. Co-operation between the federal and state public health agencies under the Social Security Act is discussed and also provision for public health training under the Social Security Act. One of the points of greater interest discussed in this chapter is the relation, both traditional and potential, between the public health organization and the private practice of medicine. Attention is called to a larger and more creative dealing with preventive medicine in the medical schools. 8. Under "State, County and Community Plans for Providing Medical Service" there is a summary of experiments made of late years to meet the needs of the indigent and low income groups by various types of co-operative plans, sometimes between the government and the medical profession; sometimes between the medical profession and social agencies and sometimes by the medical profession alone. The ways of paying, a number of commentators point out, will not create the means. 9. The chapter on state medicine deals with state medicine in the thorough-going sense—i. e., government paid and controlled doctors. The views in favor of state medicine in this sense rest on the premises that there can be no real distinction between public health and private health; that abuses in the present system such as fee-splitting can be remedied only by state medicine; that state medicine, whether desirable or not, *is coming*. The views opposing state medicine object to socializing medicine in an otherwise capitalistic system; express fear of political control; express distrust of governmental efficiency; fear jeopardizing research and destroying the doctor-patient relation. State medicine in Sweden is briefly touched upon. 10. As to the chapter on "Health Insurance," in it general objections include the feeling that it always has a demoralizing effect upon patients and on doctors, too . . . that it is not suited to American institutions and that it offers no help to the indigent, the care of whom constitutes a grave part of the present need. In the more concrete discussion objections to health

insurance include its assumed deteriorating effect on the quality of medical care, its limited coverage and its cost. . . Few seem to feel that voluntary insurance furnishes a sufficient answer to present difficulties, since it is admitted that those most in need of insurance either will not arrange to take it or cannot pay the premiums. Of course, the moot question of including medical care in the insurance arrangement recurs in the reference to some of the above points and throughout the discussion generally. This section concludes with a discussion of contract practice, a statement of the arguments for and against industrial group medicine and illustrations of various forms of industrial group medicine and of contract practice.

11. The chapter on "Limited State Medicine and Private Practice" assembles the proposals that appear in this correspondence for a further extension of government authority and government funds in the promotion of public health and the provision of medical services, integrated with the private practice of medicine. The point of view most generally behind these proposals is that increased participation of government by evolutionary process is inevitable and desirable. The development of the public health services, federal, state and local, is regarded as an outstanding possibility in the search for solution of present problems. A Federal Department of Health is frequently proposed as justified under the present powers and degree of function of the federal government in matters of health; and as imperative with the proposed increases in this functioning indicated by the present appropriations of the Social Security Act, and by such proposals as federal grants-in-aid for the care of the indigent sick, mentioned above. There is a passing reference to the possibility of interpreting (presumably by constitutional amendment) the general welfare clause of the Constitution to enable the federal government to establish a national health authority. If this is not done, even under the present constitutional limitations, the federal grants-in-aid principle, as already invoked by the Social Security Act, provides room for the evolutionary development of federal health functioning. The use of direct tax funds for hospital is discussed; also the possibility of extending the facilities of tax supported laboratories in order that the scientific aids to all diagnosis may be available to practitioners gen-

erally, and therefore to patients of all grades of income at prices they can pay, and free to the indigent."

Reading over the conclusions drawn by the committee itself as hinted at in this official resumé of its work as sent forth by Esther Everett Lape, the wind would seem to be setting in from a rather untoward quarter so far as ethical medical men are concerned. Without intimating for an instant that the American Foundation failed to act in good faith, to practitioners of years' standing and to medical economists and prophets who have been keeping a weather eye alert and a keen ear to the ground, this report would seem to be open to the eternal question as to the truth or fallacy of a "straw vote."

Compared with the excerpts from the foundation's review as set forth above, it is interesting to note that the Journal of the American Medical Association, in its editorial comment on the report, remarked:

"If there is one factor that comes out more obviously from this report than any other, it is the unlikelihood that sickness insurance, either voluntary or compulsory, will answer the problem of medical care suitably for the people of the United States. . . A time may come when some existing proportions may be reversed and when the nation will spend \$4,000,000,000 on preventive medicine and \$100,000,000 on dole."

Just as a reminder we list the members of the governing committee of the American Foundation Studies in Government as they were given to us: Curtis Bok, chairman; Esther Everett Lape, member in charge; Hugh L. Cooper, consulting engineer; Thomas W. Lamont, J. P. Morgan & Co.; Robert A. Millikan, director Norman Bridge Laboratory of Physics, California Institute of Technology; James D. Mooney, president General Motors Export Co.; Roscoe Pound, dean Harvard School of Law; Mrs. Ogden Reid, vice president New York Herald-Tribune; Elihu Root, former Secretary of State (deceased); William Scarlett, Protestant Episcopal Bishop of Missouri; Truman G. Schnabel, M. D., Associate Professor of Medicine, University of Pennsylvania; Mrs. F. A. Vanderlip, president board of trustees, New York Infirmary for Women and Children; John G. Winaut, former Governor of New Hampshire. Elizabeth F. Read was director of research.

The report is a mighty endeavor to find out



what is what in medicine. A vast amount of labor and thought has gone into its preparation. But may we inquire again . . . "WHY MEDICINE MORE THAN ANY OTHER HUMAN NEED? THERE ARE MORE HUNGRY MEN WALKING THE STREETS THAN THERE ARE SICK MEN. HOSPITALS AND PHYSICIANS' LEDGERS ARE THICK WITH CHARITY PATIENTS. WHY MEDICINE?"

### DEATH OF VENERABLE PRACTITIONER

DR. COLEMAN OF CANTON SUCCUMBS

The flag of the confraternity flew at half mast again with the passing March 31, 1937, at Canton, Illinois, of Dr. James Edmund Coleman.

For fifty-three years Dr. Coleman had practiced medicine. He died "in harness" following an emergency appendectomy. On February 28, 1937, Dr. Coleman celebrated his seventy-fourth birthday anniversary. He was born on a farm several miles southwest of Canton just as the smoke of the War of the Rebellion (1861-65) was dying away.

During the World War Dr. Coleman served as a volunteer in the American Medical Corps. He was an honorary member of the Society of the Veterans of the Foreign Wars, and a member of the First Aid Staff of the American Red Cross. For fifty-three years this able, philanthropic, cultured man had ranked high in the Masonic Order. His surviving son is also a physician—Dr. Everett Coleman. A brother—C. B. Coleman; a sister, Mrs. G. W. L. Meeker; a niece, Miss Carrie Coleman, and two grandchildren, Eleanor and Louise Coleman, also survive. Mrs. James Edmund Coleman, who was Miss Nettie Moore Porter, died January 31, 1929. Her marriage to Dr. Coleman had taken place September 27, 1887.

The late Dr. Coleman was every inch a general practitioner in that he not only attended to a large and loving practice but he took an active part in the civic, cultural and educational life of his native town, which he never forsook for any length of time, although he had a license to practice medicine in California as well as in Illinois.

He had been president of the Board of Education of Canton, and to the last kept a finger in its affairs. He was a fanatic on the subject of parks. Establishment of Big Creek Park in

Canton was due largely to his efforts. Every Christmas time Dr. Coleman headed the movement to bring a community celebration to Canton, though he was himself in every sense of the word a "year 'round Santa Claus."

One of the most consistent things about Dr. Coleman was his firm belief in the need for and the efficacy of medical organization, both for the good of the individual physician and for the profession itself, and in behalf of science, he was "an organization man." He was a Fellow in both the American College of Physicians and Surgeons and in the American Medical Association, as well as a member of the Interstate Medical Society; of the Illinois State Medical Society and both a member and past president of, respectively, the Fulton County and the Medical Tract Medical Societies and the Canton Physicians' Club, of which last named group he had been a charter member.

Though he had passed his "three score years and ten" Dr. Coleman possessed a virility and sagacity of mind, and depth of vision, and keenness of perspective that were the envy of his junior confreres. He was strictly an Illinoisan. Following his graduation from Canton High School he became a student at Rush Medical School, from which he was graduated in 1884. Primarily a surgeon, yet he was one of the pioneers in x-ray work, which was not surprising, for Dr. Coleman was the son of pioneer parents—Sarah Jane Beard Coleman and Ezra Poole Coleman, who were among the early settlers in Fulton County.

All of the hardships of a pioneer lad and of a pioneer physician were experienced by Dr. Coleman. At the outset he belonged to, and worked in, the era when anesthesia was in its swaddling clothes; a kitchen table often the operating table; and even the telephone was not the *vade mecum* of the doctor's life that it is today. His customary early morning summons came by messenger. Saddlebags had not been retired and the young medic might as frequently attend his clientele on horseback as in the favored doctor's gig! Not for him in those trying days the comforts of a luxurious automobile!

Dr. Coleman's avocation was the study of history. He held a facile pen through which he turned out much literature of merit. Aside from considerable scientific output, perhaps his best known work was a human interest anthology entitled "Canton, Illinois," for always *home* came

first. His was not the spirit of the wanderer. And "home" to him meant not only his own fireside and his own flesh and blood, but the whole immediate country in which his forebears had settled and which he himself had enjoyed as a boy and served to the last iota as a man and a physician.

### THE 1937 ANNUAL MEETING

The 1937 Annual Meeting held in Peoria on May 18, 19, 20, was one of the most successful meetings in the history of the Illinois State Medical Society. The attendance was large even though the weather was unfavorable on the first day. The Scientific Programs were unusually attractive and were well attended at all sessions.

On Tuesday Morning, May 18, the Pediatricians, for their meeting, had a symposium on the subject of Pneumonia in Children. The attendance was the largest that has attended this special meeting since it was developed a few years ago.

The Obstetricians and Gynecologists had a well balanced program with a fine attendance, showing the increasing popularity of this gathering each year.

The Central States Society of Industrial Medicine and Surgery with Dr. George Staben of Springfield as President, and Dr. Frank P. Hammond of Chicago as Secretary, had a well attended meeting on Tuesday morning which was of interest to all physicians doing industrial work.

The Oration in Medicine was delivered by Dr. Virgil E. Simpson of Louisville, Kentucky, and a large audience was well pleased with this presentation. Dr. Vilray P. Blair of St. Louis, Missouri, delivered the Oration in Surgery with the subject "Treatment of Injuries of the Face and Jaws," which was a part of the symposium on "Treatment of Acute Injuries" featured in the Section on Surgery program. Dr. Blair gave an illustrated talk on this subject to a large and highly appreciative audience.

The usual Thursday morning joint session of the five scientific sections was held with a program made up of members of each of these sections. A large attendance showed their appreciation of this unusual arrangement. On Wednesday morning the Sections on Medicine, Surgery and Radiology joined for an interesting program.

The President's Dinner on Wednesday was one of the finest functions of this character in the history of the Society. The large Ball Room of the Hotel Pere Marquette was filled with hundreds of members and guests desiring to pay their tribute to the retiring President.

The two meetings of the House of Delegates were well attended, and much business was transacted during the sessions. On Thursday morning at the closing session, the following were elected by the House:

President-Elect, Samuel E. Munson, Springfield.

First Vice-President, E. C. Kelly, Peoria.

Second Vice-President, T. D. Doan, Palmyra.

Secretary, Harold M. Camp, Monmouth.

Treasurer, A. J. Markley, Belvidere.

### Members of the Council

Third District.....John S. Nagel, Chicago

Fourth District.....E. P. Coleman, Canton

Fifth District.....Ralph P. Peairs, Normal

Seventh District.....I. H. Neece, Decatur

Eighth District.....E. C. Wilkinson, Danville

Delegates to American Medical Association—Charles B. Reed, Chicago; Charles S. Skaggs, East St. Louis; W. E. Kittler, Rochelle; C. E. Wilkinson, Danville.

Alternate Delegates to American Medical Association—Frank L. Brown, Chicago; E. P. Coleman, Canton; E. H. Weld, Rockford; C. W. Carter, Clinton; T. B. Williamson, Mt. Vernon (for one year to succeed R. J. Coultas, deceased.)

### Committees

Committee on Public Relations—W. S. Bougher, Chicago; Fred H. Muller, Chicago; H. W. Woodruff, Joliet.

Committee on Medical Legislation—John R. Neal, Springfield; M. J. Hubeny, Chicago; Mather Pfeifferberger, Alton.

Medico-Legal Committee (for three years)—A. H. Geiger, Chicago; R. O. Hawthorne, Kankakee.

Committee on Medical Education and Hospitals—N. S. Davis, III, Chicago; W. R. Marshall, Clinton; H. O. Munson, Rushville.

Committee on Relations to Public Health Administration—E. H. Blair, Chicago; Andrew Gansevoort, Chicago; Thomas Meany, Chicago; Bernard Klein, Joliet; L. O. Frech, Decatur.

The House of Delegates voted unanimously to hold the 1938 meeting in Springfield, the exact



date for the meeting to be selected by the Council.

The Scientific Exhibits Committee announced the following Awards for the best exhibits in the three general classes:

#### THE REWARDS

The Scientific Exhibits Committee reported the following awards:

##### CLASS I

*Silver Medal:* Paul Starr and R. W. Rawson: "The Thyrotropic Hormone of the Anterior Pituitary Gland. Bio-Assay by Graphic Analysis of Hyperplasia in the Guinea-pig Thyroid."

*Bronze Medal:* O. H. Robertson, W. D. Sutliff and John P. Fox: "The Lesion of Lobar Pneumonia: A Clinical and Experimental Study."

*Certificates of Merit:* Perry J. Melnick and Albert Bachem: "Histology of Irradiated Tumors."

Henry C. Sweany: "The Chemistry and Pathology of Pneumoconiosis."

C. H. Drenckhahn and Cesare Gianturco: "The Use of Perirenal Air Injections in the Diagnosis of Certain Adrenal Diseases."

##### CLASS II

*Silver Medal:* Harold D. Palmer: "Pathology."

*Bronze Medal:* Sidney O. Levinson, Elizabeth Penardocke, Albert M. Wolf: "Human Convalescent Serum—Preparation, Administration and Evaluation in Scarlet Fever, Measles and Poliomyelitis."

*Certificate of Merit:* Milton G. Bohrod: "Clinico-Pathologic Correlation."

##### CLASS III

*Silver Medal:* State of Illinois, Department of Public Health. Hon Henry Horner, Governor; Frank J. Jirka, Director. "Research Studies in Morbidity, Mortality and Public Health Organization."

*Bronze Medal:* Fred M. F. Meixner, the Illinois and Peoria County Tuberculosis Associations. "Pathology of Tuberculosis and Tuberculin Testing. Technique of Diagnosis in Youth."

*Certificates of Merit:* Chicago Heart Association, Gertrude Howe Britton, Executive Secretary: "The Prevention and Relief of Heart Disease." Harold Hill.

*Certificates of Merit:* The State of Illinois, Department of Public Health. The Illinois State Medical Society. "The Illinois Educational Program in Maternal and Child Hygiene."

#### TESTIMONIAL DINNER TO DR. CHARLES B. REED

The staff of Wesley Memorial Hospital and friends of Dr. Charles B. Reed are giving a testimonial dinner in honor of his fiftieth year devoted to the Practice of Medicine, to be held Wednesday evening, June 23, 1937, at seven o'clock at the Union League Club.

Dr. Reed is a past president of the Chicago Medical Society, also a past president of the

Illinois State Medical Society and at present a member of the Council of the Illinois State Medical Society.

#### EFFECTS OF VERY EARLY SERUM TREATMENT IN PNEUMOCOCCUS TYPE I PNEUMONIA

In order to determine more accurately the effects of very early serum treatment, Russell L. Cecil, New York (*Journal A. M. A.*, Feb. 27, 1937), has collected a series of 160 cases of type I pneumonia in which concentrated type I serum was administered during the first twenty-four hours of the disease. There were eight deaths, a mortality rate of only 5 per cent, one-third the death rate for all serum-treated cases, one-sixth the standard death rate for non-serum treated cases. Physicians who are interested in public health can now visualize the ultimate control of pneumonia, for there is every reason to believe that what has already been accomplished with type I serum can be achieved with the other types as well. When patients with pneumococcus type I pneumonia are treated very early with homologous serum, the following phenomena are usually observed: 1. The disease may be completely aborted, the temperature and the pulse and respiration rate dropping to normal within twelve to twenty-four hours after the administration of serum. 2. There is striking improvement in the patient's general condition, as the result of the disappearance of toxemia. 3. Early serum treatment prevents the spread of infection from one lobe to another and even limits the area of infection in the lobe primarily infected. 4. Bacteremia is prevented or, if already present, is quickly checked. 5. The leukocytes rapidly return to normal. 6. Homologous agglutinins, precipitins and protective bodies promptly make their appearance in the circulating blood. 7. Skin tests become positive to the homologous polysaccharide.

Drafts do not cause colds. Colds are definitely caused by infection from another person. Disease does not float about in drafts. Bacteria in minute droplets of moisture issuing from human beings in crowded places can infect persons within a distance of five feet or more during conversation, or when coughing or sneezing.

Discoveries which led to an understanding of how colds and other diseases are carried by bacteria from one person to another were made by Louis Pasteur, a French chemist.

#### SOCIALIZED MEDICINE

The proponents of socialized medicine have based their arguments on the false premise that there is a lack of available medical care. Defenders of organized medicine, thus deftly drawn into an absurd argument, have expended useless efforts in denouncing an obvious fallacy. Such discussions have done much to obscure the crux of the issue—the question of how good medical care can best be provided. Quantity versus quality. Not many pills, but the right ones!

—Detroit Medical News.

## MEDICAL ECONOMICS

W. M. Hartman, M. D.  
E. P. Coleman, M. D.  
John R. Neal, M. D.  
Ralph Peairs, M. D.  
P. H. Kreuscher, M. D.  
C. E. Wilkinson, M. D.

Edited by the Committee on Medical Economics  
of the  
Illinois State Medical Society  
E. S. Hamilton M. D., Chairman  
Kankakee, Illinois

H. M. Camp, M. D.  
R. L. Green, M. D.  
I. H. Neece, M. D.  
R. K. Packard, M. D.  
C. B. Reed, M. D.  
C. S. Skaggs, M. D.

Address all letters and communications to the Chairman.

To those interested in the subject of medical economics the annual meeting of the Illinois State Medical Society held last month in Peoria was particularly encouraging. Not only did the rank and file of the membership show the greatest interest in the subject up to this time, but, in addition, definite action was started which should react to the good of the medical profession of both the state of Illinois and the nation.

Probably the most important decision was to raise the dues for the year of 1938, three dollars. Even with this raise, the annual dues of the Illinois State Medical Society are as low as any other in the country and much lower than the majority. The imminence of a concerted attempt to start *State Medicine* in this country should have been brought home to every man in Illinois, by the fact that within the last month a bill has been introduced in the legislature of our neighbor to the north, Wisconsin, to make state medicine available to every man in the state. In addition, reformers promise that the abridged Epstein Bill will be introduced into the legislature of every state in the country as fast as possible and that every attempt would be made to pass the same. To properly combat this attempt it will be necessary for organized medicine of this and every state to make use of every possible method of educating the citizens of the state as to the actual facts in regard to *State Medicine*, with particular emphasis on the dangers inherent to *State Medicine*. This will cost the medical profession greatly both in time and energy as well as money. The methods in use in New York State should be studied and used as an example of a most successful method. If it is necessary to alter the plan in use there to fit it to Illinois, we should be financially able to do so. In New York all parts of the state are supplied weekly with current medical information. This is distributed through the newspapers. To do this it is necessary to have the ma-

terial prepared by a newspaper man so as to make it acceptable to the editors and at the same time have it interestingly enough presented to arrest the attention of the reading public. This is an additional expense that must be borne by organized medicine. In addition in the state of New York, prepared speeches are made available to the members of the medical profession interested in and willing to aid in the education of the public along economic lines. Again, this is best done through the aid of a trained writer and publicist, who can either prepare the talks himself from prepared data or edit talks made by different members of the profession, and make them available to all men, willing and able to use them. In addition, these talks can be abstracted so that any part of them can be used either in a talk or for use by the press in reporting talks by the medical profession. This all requires money, which will be available when the increased dues begin to come in.

For the first time this year there was talk of special meeting for the Secretaries, at a time other than the annual meeting. This is most encouraging for it shows that there is a realization that something should be done to both train and help the Secretary in his work. For a real secretary makes a county society, just the same as it does a state society. It is a difficult job for a young man to take over the work of a secretary with little or no instruction and usually no help by their predecessors. If the State Medical Society can help these men by holding a one day meeting some time early in the year, so that the incoming secretary can receive both real help and enthusiastic support, it is their duty to do so. Too often, the job is wished on a new man, who previously knows nothing about the work and often he feels it his duty to accept even though he feels that he has been selected because nobody else wants the job. If the new man has the necessary time and enthusiasm he



will probably make a success of his new job, unless early criticism discourages him. The state society should realize its obligation to its local representatives. To be sure the idea was defeated this year, but that is not surprising for few people have considered this need and little time was given to the discussion of the subject. We feel sure that another year will convince many more physicians of the advisability of this idea.

The election of new officers will result in the formation of new committees both in and out of the Council. Those in the Council will be announced by the new Chairman, Dr. E. P. Coleman. So this is the last report of the outgoing Committee. We realize that we have not accomplished nearly as much as we should. However, if we have made some of you think about our economic problems, our labors have not been in vain. And from talks with members of the society at Peoria we feel that an ever increasing number of the physicians of the state are reading the column and becoming interested in our problems. No longer do they look upon all those who have been interested in the subject the past few years as long haired reformers, but rather as fellow physicians who have been trying to carry a message to the profession, which until recently had been too busy with other problems of medicine to take the time to study this one. Members of the Committee have given freely of their time without thought as to recompense or credit. The Chairman of the Committee wishes to thank each and every one for their wholehearted support and assistance in making this column as successful as it has been. He hopes that his successor will receive that same cooperation from the new committee and increased interest from the medical profession of the state. Real cooperation and support will greatly increase the scope of its influence and result in accomplishments of good to the medical profession not as yet dreamed of.

E. S. Hamilton,

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### Correspondence

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Springfield, Ill., April 30, 1937.

#### DIPHTHERIA IMMUNIZATION

*To the Editor:* The activities of detail men in their efforts to sell alum precipitated diphtheria toxoid to physicians, one injection of

which has been claimed to be adequate for bringing about immunity to diphtheria, has been attracting the attention of the Illinois Department of Public Health within recent months. Although we favor the reduction of the number of injections required in protecting human beings against communicable diseases, we do not feel that one dose of alum precipitated toxoid is adequate for the purpose intended. In order that human beings be adequately protected against diphtheria, a sufficient number of injections should be made to stimulate the development of a reasonable amount of circulating diphtheria antitoxin in the blood. It has been found by several investigators, among whom are Fraser and McKinnon (Canadian Journal of Public Health), and Pansing and Shaffer (American Journal of Public Health), that an adequate diphtheria antitoxin level is not maintained following one injection of alum precipitated toxoid. Comparisons made between plain toxoid and alum precipitated toxoid by members of the personnel of this Department have resulted in similar observations.

Because of these discoveries, the Illinois Department of Public Health now recommends the employment of three doses of 1 cc. each of plain diphtheria toxoid, with an interval of three weeks intervening between each injection. Or two doses of 1 cc. each of alum precipitated toxoid, with an interval of three weeks intervening between injections. If these recommendations are followed, the diphtheria antitoxin level will be raised to a point sufficient to insure protection for a long period of time. It is deemed advisable not to administer toxoid to children at six months of age, as was formerly recommended, but to wait until they reach the age of nine months.

Inasmuch as the majority of children under ten years of age are susceptible to diphtheria, it is advised that all children up to that age be given injections of toxoid without a preliminary Schick Test. However, a follow-up Schick Test should be performed six months following the last injection of toxoid in every instance, in order to find the one child in ten who does not develop immunity to diphtheria following the standard procedures. Some physicians perform Schick Tests in a shorter time, but the six month interval is considered to be most satisfactory. Positive reactors discovered at this time should

receive additional injections of toxoid in order that they have adequate protection against this dreaded disease. Large numbers of children in this state have already been protected against diphtheria, but the 644 new cases already this year indicate that large numbers of children have not yet been immunized. It is primarily the responsibility of the family physician to advise and educate parents as to the need and value of diphtheria immunization for their children.

Plain diphtheria toxoid, alum precipitated toxoid, and diphtheria toxin for performing Schick Tests are available to physicians free of local cost from the Illinois Department of Public Health for their convenience in carrying out diphtheria immunization.

Dr. Frank J. Jirka,  
Director, State Dept. of Public Health.

Chicago, Ill.

#### WANTED

##### A TOTALLY DEAF-BLIND CHILD

*To the Editor:* Some one totally deaf and totally blind child who is a citizen of Illinois, preferably a child who has been totally deaf-blind since birth, irrespective of age if between infancy and fourteen years, is desired for special training and education by Prof. Robert H. Gault and Staff of the Psychology Department of Northwestern University, Evanston.

If any member of the Illinois Medical Society has in his practice such a child he is invited to write directly to Prof. Gault.

Such a child will be placed in a private home at no expense to his or her parents should they be unable to contribute to the child's maintenance, will have pediatric and neurological supervision, and will be taught by the finger-tip-vibration-perception method and also taught lip reading and later Braille. For these, the expenses are provided.

This is a wonderful opportunity for some doubly handicapped child, handicaps which to date only Helen Keller has overcome. Scientific methods worked out recently may not only help this new case but it is hoped will be of future value in many deaf children especially if they are also handicapped by blindness.

I have kept in touch with the work now being done in that psychological laboratory and am very well pleased with the personnel and the

methods and the care they give the children on whom the preliminary work has been done.

H. S. Hulbert, M. D.,  
30 No. Michigan Ave.

#### A SIMPLE METHOD TO MAKE SPINAL PUNCTURE EASY

I believe the only reason spinal puncture is sometimes difficult is because the needle does not enter in a perfectly true line from the skin on through the deep tough fascia

A slender needle deviates enough to miss the spinal canal. The spinal guide now on the market overcome this, provided we are able to insert that perfectly true. The point will deviate, and it requires considerable practice and skill to keep the point directed exactly toward the spinal canal, because the knurled stub is too short to guide it with the finger.

I have found a simple method, that requires no more skill than a vein puncture, and so far as I am aware has never been suggested before.

Simply this:—A short 16 gauge needle of ordinary type, one inch, or one and one-fourth inch long, is used for the spinal needle guide.

A 16 gauge needle will take a 20 gauge spinal needle.

The guide needle is inserted attached to an ordinary hypodermic syringe.

The syringe acts as a handle and gives you the positive direction of the guide point, which is the secret of the whole procedure. After the guide is inserted the syringe shows it is exactly at a right angle to the canal.

Then detach syringe and insert spinal needle.

F. T. Brenner, M. D.

#### EDUCATIONAL COMMITTEE

*Report for April and May, 1937*

##### DO YOU KNOW—

That the Educational Committee has been supplying 85 newspapers with a weekly editorial relating to problems confronting medicine and the public? That, in addition to these newspapers, the Committee is supplying daily, weekly or monthly health columns to about 200 Illinois newspapers?

##### DO YOU KNOW—

That the Educational Committee during the last two months supplied programs for 88 lay organizations and that 16 of the talks were on the subject of SYPHILIS?

That the audiences ranged from 50 to 2,500 lay persons?



That the Committee scheduled talks on MEDICAL PROBLEMS AND THE PUBLIC for the following groups during April and May: Optimists, American, Kiwanis Clubs of Peoria; Woman's Auxiliary of St. Clair County and the Irving Park Branch of the Chicago Medical Society; Kiwanis Club of LaGrange; Forum of several hundred students at the Austin High School, Chicago; Parent Teacher Association of Silvis; Y. M. C. A. of Hyde Park, Woman's Club of Armstrong?

That the Committee was requested to schedule doctors to address two important sessions of the Illinois Congress of Parents and Teachers Annual Meeting—each attended by several hundred women from all sections of Illinois?

#### DO YOU KNOW—

That 35 radio talks were given over Chicago stations and that copies of talks were furnished downstate counties for local use?

That 3 radio programs were given in Peoria during the Annual Meeting?

#### DO YOU KNOW—

90 Scientific programs were arranged for county medical societies through the Scientific Service Committee—these included post-graduate lectures on obstetrics and pediatrics?

#### DO YOU KNOW—

1,900 articles were sent to Illinois public libraries, Home Bureau Advisers, WPA leaders? The material included the editorial articles going out to the 85 newspapers.

#### DO YOU KNOW—

That contact was made with every county medical society and every Summer Round-Up Chairman in regard to the Summer Round-Up or Preschool Examinations sponsored by the Parent Teacher Associations?

#### DO YOU KNOW—

That the Committee has kept in touch with the Maternal Welfare Committee and that meetings have been held to discuss the post-graduate courses being given in the state and that steps are being taken to rectify mistakes made in the first courses?

#### DO YOU KNOW—

That in its individual service to county medical societies, the following assistance was given?

- 900 notices sent out for LaSalle.
- 200 notices sent out for Lee & Whiteside.
- 87 notices sent out for Bureau.
- 290 notices sent out for Randolph.
- 240 notices sent out for Effingham.
- 154 notices sent out for Franklin.
- 186 notices sent out for Henry.
- 137 notices sent out for Perry.
- 90 notices sent out for Jefferson-Hamilton.

That publicity was given meetings of the State and county societies as follows:

- 724 releases about Annual Meeting.
- 63 releases about LaSalle.
- 50 releases about Bureau.
- 26 releases about Randolph.

50 releases about Henry.

46 releases about Warren.

17 releases about Franklin.

29 releases about Jefferson-Hamilton.

68 releases about Fulton-McDonough.

9 releases about branch meetings Chicago Medical.

#### DO YOU KNOW—

That the Committee has had many favorable comments on the health exhibits displayed in the Marshall Field & Co. window and that the exhibit is changed monthly?

Respectfully submitted,

Jean McArthur.

#### AMERICAN BOARD OF SURGERY ORGANIZED

In answer to the widespread demand for an agency which will attempt to certify competent surgeons, the American Board of Surgery has recently been organized. This Board is a member of the Advisory Board of Medical Specialties, which includes all of the boards of certification for the different medical specialties which have been already organized. Since boards were in existence for the certification of practitioners of some of the surgical specialties, such as ophthalmology, otolaryngology, obstetrics and gynecology, genito-urinary surgery and orthopedic surgery, it is expected that the American Board of Surgery will be responsible for the certification of general surgeons as well as those practicing in the remaining specialized subdivisions of surgery.

This Board is a non-profit organization. All fees will be used, after a reasonable amount is set aside for necessary expenses in maintaining its office, conducting examinations, etc., to aid in improving existing opportunities for the training of the surgeon.

The Board will hold its first examination (Part I, written) on September 20, 1937. All inquiries concerning applications for this examination should be received by the secretary's office promptly.

Requests for booklets of information, application blanks, and other information should be addressed to the Secretary—Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia, Pennsylvania.

#### SUBSTITUTION OF NURSES

Probably initiated from the standpoint of hospital economics, the substitution of nurses for physicians in administering anesthesia has become widespread during the last twenty years. In many localities it was first necessary to change state laws before nurses could be granted this privilege. Departments of anesthesia were set up to train nurses and dentists along with physicians. Thorough, supervised instruction in the theory and practice of anesthesia preceded full responsibility during actual operative technique.

Whether or not the employment of nurses is discontinued in this capacity, these well organized teaching departments should be preserved under the department of surgery.

—The Bulletin of The Academy of Medicine of Cleveland.

## Original Articles

### ENDOCRINE PROGRESS AND ITS RELATION TO ESSENTIAL HYPERTENSION AND DIABETES MELLITUS

JAMES H. HUTTON, M. D.

CHICAGO

General knowledge of endocrinology is retarded by a voluminous and rapidly expanding literature in which are contained relatively few facts of clinical significance. At one time thought in this field was dominated by clinical endocrinologists, some of whom were not careful clinical observers. Their publications sometimes tended to bring the entire subject into disrepute. Later the experimental physiologists came to dominate the field and too often it was difficult or impossible to make any clinical application of the data they offered.

Nowadays many contributions are coming from men who know something of clinical medicine as well as experimental physiology. As a result it is becoming evident that some of the ideas early advanced by clinical endocrinologists were correct. For example, the experimentalists have proved that almost every endocrinopathy is bound to be a pluriglandular affair by the time it reaches the doctor. More and more of these products are proved to be effective by mouth. It is now generally recognized that thyroid, pituitary—both the anterior lobe and the whole gland—suprarenal and the gonads are effective by mouth. Such men as Sevringhaus<sup>1</sup> and Mazer<sup>2</sup> seem to have demonstrated that some of the standardized estrogenic preparations are effective by mouth and in some instances may be given that way to advantage.

Twenty-five years ago the late John B. Murphy once said, "Doctor, let the patient tell his story and he will tell you what is the matter with him." Murphy might well have been speaking of endocrinology, because in no other field of medicine is a careful, extensive and intensive history so important. In a diagnostic study, particularly of pituitary disorders, a complete history ranks first in importance, physical examination second and the laboratory data

third. This in no way minimizes the value of as complete laboratory data as one can secure.

The pituitary-gonadal relationship has come to occupy the limelight and a large number of preparations have been perfected for use in this field, particularly in the treatment of sexual disorders of various sorts. The terminology of these preparations has become somewhat confusing; but if a few facts are remembered, any product offered to the clinician can be put into its class and compared with those with which he is already familiar. The gonadotropic preparations are said to be effective only in animals with gonads intact. It is helpful to think of them as stimulating the gonads and bringing about their effect in this way though that idea may not be entirely correct. They are extracted from the anterior pituitary itself, from pregnancy urine and from the placenta. Examples of those extracted from the pituitary are prephysin, gynantrin and maturity factors. Antuitrin S, follutein and antophysin are made from pregnancy urine. A. P. L. comes from the placenta.

The estrogenic preparations act on the genital tract directly and are effective even in castrates. These products are also made from pregnancy urine, the amniotic fluid and the placenta. Examples are theelin, theelol, amniotin and progynon. Agomensin and sistomensin are extracted from the ovary itself.

The potency of these products, both gonadotropic and astrogenic, is expressed in terms of rat or mouse units and so measures biologic activity. The international unit refers to a definite weight of the product and has no necessary relation to its biologic activity.<sup>3</sup>

The gonadotropic preparations are useful in: functional uterine bleeding of either menorrhagic or metrorrhagic type; amenorrhea or oligomenorrhea; dysmenorrhea due to inadequate corpus luteum secretion; functional and developmental abnormalities, such as infantilism, adiposogenital dystrophy, or delayed puberty; habitual or threatened abortion; cryptorchidism, aspermia, impotence; acne vulgaris.

The estrogenic preparations are useful in certain menstrual disorders, notably amenorrhea, oligomenorrhea, delayed puberty and the symptoms of the menopause. In the last, it may be that they act in two different ways: 1. by inhibiting pituitary activity and, either directly or through the pituitary, adrenal activity and

<sup>1</sup>Delivered before the St. Clair County Medical Society, March 4, 1937.



2. by direct replacement of other ovarian functions.

As knowledge of endocrinology increases, syndromes formerly not thought of in this connection are found to have some endocrine facet. This is particularly true of essential hypertension and of diabetes mellitus. At the Illinois Central Hospital we have been particularly interested in this subject for the past four years. I should like to present for your consideration and criticism some of the phenomena we have observed in this connection. This work was undertaken in the belief that these two syndromes had a common etiological factor. This was thought to be a functional disturbance of the pituitary and/or adrenals which could be corrected by low dosage irradiation of these two structures.

A glucose tolerance test has been done on a number of hypertension patients, the results of which are shown in Table 1. Very few of these patients spilled any sugar in the urine. The sugar curve in most of these cases rose steeply reaching its peak in one hour or less, and in most patients it returned to near the fasting level at the end of three hours.

TABLE 1.—GLUCOSE TOLERANCE TESTS ON 136 HYPERTENSION PATIENTS

Blood sugar rose to 170-200 mg.....	31
Blood sugar rose to over 200 mg.....	55
Non-diabetic type of curve.....	50
	<hr/>
	136

The findings in regard to the basal metabolic rate in a series of hypertension patients are shown in Table 2.

TABLE 2.—B. M. R. DETERMINATIONS ON 133 HYPERTENSION PATIENTS

Lower than minus 5%.....	40
Normal .....	48
Higher than plus 10% .....	45
	<hr/>
	133

One of these patients had twice undergone a subtotal thyroidectomy. When she came under observation she presented the typical symptoms of this condition and a third operation had been advised. Her basal rate was plus 56%. Her blood pressure was 205/75. After six treatments her blood pressure was 135/95 and her basal metabolic rate was plus 18%. Seventeen months after the last treatment the blood pressure was 155/90; the B.M.R. plus 14%.

Another woman, aged 46, presented the typical symptoms of hyperthyroidism with a

basal rate of plus 48%. Her blood pressure was 170/100. After three treatments on February 6, March 8 and April 12, 1931, her basal rate was minus 6% and her blood pressure was 145/90. There has been no recurrence of the symptoms of hyperthyroidism. Her blood pressure has risen above normal at various times necessitating three further treatments. At the present time her blood pressure is 140/85.

Dr. J. V. Fowler<sup>1</sup> reports a case of hyperthyroidism which he operated on three times and which had been previously operated on once by another surgeon. Symptoms of hyperthyroidism which recurred after the last operation were promptly relieved by irradiation of the pituitary and adrenals.

A few other cases of hyperthyroidism have been seen which were entirely uninfluenced by this treatment. In such cases the hypertension was also uninfluenced or not satisfactorily controlled by this therapy. Some cases of Graves' disease without hypertension have been treated in this manner without effecting a cure. One of these cases referred by Dr. W. T. Harsha has since undergone a subtotal thyroidectomy by him with complete relief of symptoms.

The resemblance between diabetes mellitus and essential hypertension is indicated by the fact that in this work we have seen 31 patients that exhibited both essential hypertension and diabetes mellitus. In some of these patients the diabetes came first; in others the essential hypertension came first and the diabetes later. In most cases it was not possible to determine which came first. The results of treatment in these cases are shown in Table 3.

TABLE 3.—HYPERTENSION AND DIABETES

Improved as to both conditions.....	12
Improved as to hypertension only.....	7
Improved as to diabetes only.....	3
Unimproved .....	2
Insufficient treatment .....	5
Can't follow .....	2
	<hr/>
	31

An example of the patient's response is shown by Mr. S. C., aged 52, referred by Dr. Don Smith of Hope, Arkansas. He was living on a diet of carbohydrate 90, protein 60, fat 90, 1410 calories, with which he took 22 units of insulin per day. He had experienced a cerebral insult in May, 1936, which left as a residue a weakness and coldness of the left leg. His blood pressure was 170/90. His blood sugar after insulin and breakfast was 169 mg. He had one treatment on December 22, 1936. His blood pressure declined to 120/70. His blood sugar after breakfast and without

insulin four days after treatment was 151.1 mg. His diet was increased by 40 grams of carbohydrate. He took no more insulin and on January 2, 1937, his blood sugar after breakfast was 71.1 mg. He has continued to remain sugar free but a blood sugar determination has not been made since. Under excitement his blood pressure rises to 170 but declines to about 150 when he is ordinarily employed. He has gained considerable weight and strength and the coldness he complained of in his left leg has entirely disappeared.

Symptoms recurred one year later and another thyroid operation was done.

\*April 29, 1937—Blood sugar after breakfast was 102.4; blood pressure 155/85. He had gained 20 pounds and had taken no insulin since Dec., 1936.

The results in essential hypertension are shown in Table 4.

TABLE 4.

Improved .....	135
Improved but relapsed .....	15
Unimproved .....	79
Insufficient treatment .....	40
Can't follow .....	21
	<hr/> 290

Some of these cases respond satisfactorily with very few treatments.

Mrs. P., aged 57, was examined on February 27, 1936, and found to have a blood pressure of 195/95. She complained of vertigo and tinnitus. She had one treatment on February 29, 1936, and the blood pressure declined to 165/90. April 16 it had risen to 180/90. At that time one more treatment was given. The blood pressure has remained at practically normal levels ever since. She is entirely symptom free.

Other patients experience a satisfactory fall in blood pressure after a very few treatments. Later the blood pressure may rise, sometimes to the original high level, and be unaffected by further treatment.

Mr. M., an engineer, was referred from the Illinois Central by Dr. Ernest C. Olson on June 16, 1934. He was 57 years old and had a blood pressure of 200/120. He had one x-ray treatment. Two weeks later his blood pressure was 175/105. August 11 he was given one more treatment. After that his pressure varied. It went up almost to the original level but by a number of treatments it was kept under 200 systolic with a diastolic of 100 or under. However, in 1936 the blood pressure began to rise and while a good deal of the time it was around 165-185/100-110, in the latter part of the year it began to register 200 or slightly above quite frequently and showed very little response to further treatment. The last reading on February 13, 1937, it was 190/100. Treatment in the last few months has made little impression and it appears likely that this man will eventually be disqualified for engine service because of his hypertension. The only symptom he has ever complained of was slight heart consciousness and that was noticed only when he first came under observation. It has not returned as his

blood pressure has tended to rise toward its original level.

At the present time it may safely be said that the hypertension of some patients can be satisfactorily controlled over considerable periods of time by this method of therapy. Others are satisfactorily controlled for a short time and then experience a relapse to the former condition which is uninfluenced by further irradiation. In a good many cases the symptoms can be relieved even when the blood pressure is little affected. In other cases the symptoms are relieved and the blood pressure is also reduced to fairly satisfactory levels. Following excitement or infection the blood pressure may rise again without any coincident return of symptoms. Some cases of essential hypertension are practically unaffected by this treatment. Most of these were either patients who presented no symptoms or who had progressed to the point where organic changes were present in the cardiovascular and renal systems. In the latter treatment was undertaken in the same spirit that a drowning man grasps at a straw.

Men in various parts of the country have used this form of therapy. Their experience is shown in Table 5.

TABLE 5.—HYPERTENSION CASES OF OTHER MEN

	Cases	Cases Improved
Martin .....	100	80
Baker .....	40	30
McGuffin .....	40	30
Finch .....	12	9
Konantz .....	6	3
Parkhurst .....	5	3
Hadley .....	4	4
Miscellaneous .....	56	47
	<hr/> 263	<hr/> 206

Various factors have been used in these treatments. Those used most recently are as follows: 120 kilovolts, 3 milliamperes, 50 cm. skin target distance, 2 mm. aluminum filter, 5 minutes, 50 R units. This dose is sometimes changed by increasing the time to 7 minutes giving about 70 R units. In our experience larger doses are not effective and besides are sometimes followed by unpleasant reactions characterized by headache, vertigo, weakness and nausea. We are by no means certain that the factors mentioned are the best. In some cases even smaller doses have been effective, but in general the factors described here served us best.

Treatments should not be given oftener than once a week and may sometimes be spaced at



much greater intervals. For the past year we have been using the blood pressure as a guide to further treatment. Blood pressure should be measured every week or oftener. Whenever a marked fall occurs, no further treatment is given until the blood pressure begins to rise or it becomes evident that no further fall can be expected from the treatment already given. If after three treatments no marked fall in pressure has occurred, the dose is changed as indicated above to 70 R units. Treatment to women should not be given within one week preceding a menstrual period.

Both sides of the pituitary and the adrenals are treated at the same time, the adrenals through a common portal 15x15 cm.

The doses used are so small that the treatment in competent hands is entirely safe. In some three hundred odd cases of our own series no damage of any kind has ever been noted. It has been suggested that there is danger of producing Addison's disease or hypopituitarism. The literature shows that these structures can be exposed to many times the amount of irradiation used in this series without any damage.

*Conclusions.* There is so little evidence to support the pancreatic theory of diabetes that it should be discarded and the etiology of this condition sought for de novo. Diabetes mellitus and essential hypertension have so many points in common that it seems only reasonable to believe that they must have several factors as to their etiology in common. This method of therapy is based on the belief that this common factor is a functional disturbance of the pituitary and/or the adrenals which, if it cannot be corrected, can at least be favorably influenced in the majority of cases. It is offered as an addition to our armamentarium in the treatment of these conditions.

This work has been possible through the cooperation of Chief Surgeon Dr. Dowdall, Drs. Lampe, Morris, Olson, Sloan, Culpepper and Madden of the Illinois Central Staff, and Miss DuBois in the X-ray Department.

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## NEUROGENIC-SARCOMA

### Case Report

I. EDWARD BISHKOW, M. D., F. A. C. S.

CHICAGO

Ewing first established this disease as a clinical and pathological entity.

In discussing neurogenic sarcoma, he states "this condition is so infrequently seen by any one surgeon, and its appearance is so benign and innocent, that its serious nature is commonly missed."<sup>1</sup>

A reiteration and emphasis of certain facts concerning such a grave condition is in order, especially since we are concerned with a type of malignancy which early recognized and adequately treated offers a chance of 50% cures.

Many excellent monographs on this subject have been written by Ewing, Quick & Cutler, Birk, Regaud, Kuttner and others, and in all these papers one is struck by the repeated warnings, that these seemingly benign growths, because of their accessibility, superficial locations and free motility, invite a simple excision with resultant recurrences, metastases and death.

Once this emphasis is impressed on the surgeon it becomes imperative that all fascial growths, no matter how well encapsulated and isolated they may appear, should be biopsied.

It is the belief of Ewing, as well as others, that fibrosarcoma, spindle cell sarcoma and fascial sarcoma, are in the vast majority of cases neurogenic in origin.

The neurogenic sarcoma is considered the most radio resistant of any type of sarcoma cell.

The microscopic appearance is that of spindle shaped cells with varying amounts of stroma, and clinically the degree of malignancy of these tumors follows rather closely the proportion of cells to the amount of connective tissue stroma present.

The course of neurofibro-sarcoma of the deeper nerve trunks is generally unfavorable. A high proportion recur after each operation with increasing extensions and more active proliferation of cells of more atypical quality.<sup>2</sup>

The sarcoma cells may infiltrate the muscle tissues and erode into blood vessels, so being disseminated and producing metastasis most frequently in the pulmonary fields.

The usual postoperative recurrence presents

an indurated scar, firmly adherent to an underlying mass which extends widely in and between the muscles, along the fascia and even to the bone.

These tumors when recognized, have been attacked by x-ray, radium or excision, and by combinations of these agents.

Regaud, J. Roux, Berger et al in a report of nine cases treated at the Radium Institute of Paris, by radium and x-ray alone, had fatalities occur in all.<sup>3</sup>

Kuttner, who advises wide excision as the treatment of choice, reported 30% cured.<sup>4</sup>

Seyerlin, Holzel, from a total of 75 cases in 15 years, reporting on 9 cases of sarcoma of the chest wall, from the records of Memorial Hospital of Cornell University, obtained 5 cures and 4 deaths by employing wide excision followed by radiation.<sup>5</sup>

At variance in some aspects with the above experiences are those of Channing C. Simmons from the Collis P. Huntington Memorial Hospital.

In 42 cases of fibrosarcoma out of a total of 177 cases of all types of sarcoma, he concludes that neurogenic sarcoma can be cured in most cases by excision. In many instances fascial sarcomas are radio sensitive, however, the post-operative use of radium prophylactically was of no value.

In inoperable sarcoma with metastasis he feels radium is of value to relieve pain and prolong life.

He concurs with other observers that the histological picture of the tumor quite accurately determines the prognosis provided of course treatment is early and energetically employed.<sup>6</sup>

Nesselrode & Walker obtained cures in two cases of fascial sarcomas of the abdominal wall by radical excision and post-operative use of radium.<sup>7</sup>

E. M. Bick has contributed several exhaustive and instructive papers on the subject of neurogenic sarcoma<sup>8-10</sup> and his experiences and conclusions parallel closely those of Quick & Cutler and Ewing.

The latter have found pulmonary metastasis occurring in 20% of cases classed as Groups 2 and 3 in malignancy but none were observed in Group 1.

Their experience seemed to indicate that

neurogenic sarcoma of the thigh has an especially bad prognosis, as only 2 out of 15 are alive, and that the pathological specimens from this area are uniformly highly malignant.

Case Report: W. M. W., male; aged 38 years; executive, married. Presents himself for examination on December 7, 1930.

History: Personal: For the past year has noticed a subcutaneous mass, the size of a plum, at the angle of the right scapula, freely movable and not tender. This mass had apparently not increased in size.

He seeks medical advice because, due to its position,

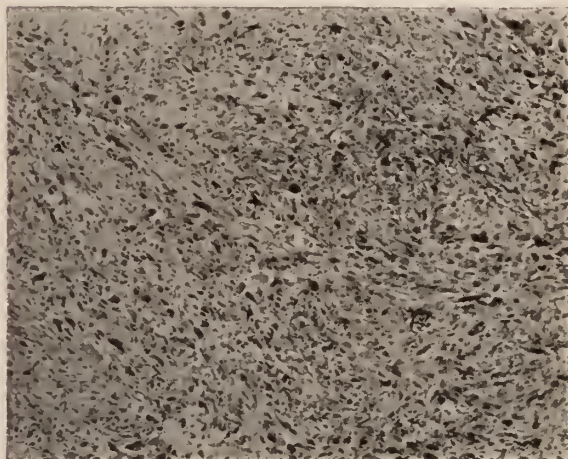


Fig. 1. Low magnification of primary growth, showing fibrosarcoma with areas of great cellular anaplasia and extensive regressive changes.

it is annoying when pressed upon in leaning against back of chair or reclining.

Family: Mother living and well. Father has been a diabetic for years and about one year ago had a malignant growth removed from tongue. One brother living and well.

Marital History: Wife living and well. Two sons living and well. One son died 7 days after birth from cerebral hemorrhage due to difficult labor.

Examination: Well nourished and robust appearing man, with appearance of perfect health. Head, neck, abdomen and extremities normal.

Chest: Expansion symmetrical and normal.

Heart normal in size and position.

Heart tones clear, regular. Pulse 72.

Lungs: Normal breath sounds.

Just above angle of right scapula is present a mass, the size of a plum, which is not attached to the overlying skin, and is freely movable. On motion of right arm, this mass seems separate from the muscles. It is moderately firm and very slightly tender. The skin over and around this area is normal in appearance.

The preoperative diagnosis was fibroma.

Operation: On December 11, 1930, under local infiltration anesthesia the mass was excised and wound closed. The patient remained in hospital for 24 hours.



The pathological report submitted by Dr. R. H. Jaffe, December 18, 1930, reads:

"Firm tumor 5x4x3 cm. in diameter composed of a firm, grayish white tissue centrally liquefied.

*Microscopic:* Fibro-Sarcoma with areas of great cellular anaplasia and extensive regressive changes. The tumor seems to arise from the fascia of a muscle."

In discussing this report with Dr. Jaffe, he placed it Grade 2 in malignancy, and was rather dubious as to the prognosis. He expressed the feeling that this type of tumor would be radio resistant. (Fig. 1)

Patient, however, was referred for X-ray treatment and received five exposures of  $\frac{3}{4}$  erythema dosage.

The wound margins separated with escape of a thin sero-sanguinous discharge which finally healed and a flat firm button-like plaque appeared in the incisional scar about four months later.

X-ray examination of the lungs revealed no metastasis present.

On April 29, 1931, under gas anesthesia, the mass and tissues well beyond and under the mass, were excised.

The pathological report of Dr. R. H. Jaffe follows:

"In the subcutaneous fatty tissue a moderately firm light grayish white irregular node about 17 mm. in diameter is present attached to the cutis.

*Microscopic:* Dense scar tissue with foreign body tubercles. In the depths of the scar actively growing sarcomatous tissue. Fibrosarcoma with marked cellular anaplasia and numerous giant cells. There are no signs of any effect of previous x-ray treatment, the tumor cells being well preserved and showing signs of active growth."

This operation was followed by radium bombing of 6000 m.c.h. over 3 ports at a 6 c.m. gap. Approximately five months later another recurrence was seen at the upper end of scar about 2 c.m. in diameter.

At this time I sent patient for an opinion to Dr. James Ewing and also submitted slides from primary tumor and recurrent growth.

His observations and conclusions as stated in a letter dated October 9, 1931, are so lucid and positive, in view of the subsequent course, that I feel it profitable to quote freely from this communication. He writes:

"The section shows a fibrosarcoma of neurogenic origin, parts of which are myxosarcomatous, others more fibrous, with large giant cells. I would place it grade 2 in malignancy. These tumors are not very radio sensitive as a class, but they will respond to full doses continued over a long period.

"In this case the 6,000 mc. hours is not enough. We would give 3 or four times that amount over a period of two or three months and expect to blister the skin. I think the best plan here would be to use interstitial radiation by needles preferably, or possibly gold seeds. In this way you will get in the killing dose without much damage to the skin. I would advise against further operation. The exact dosage and method must be determined by the response to radiation. With interstitial radiation, I would expect a favorable result."

This advice was carried out by Dr. Frank E. Simpson. 22,000 m.c.h. of radium was employed at a 6 cm.

gap and on January 12, 1932, 20 radon seeds were implanted interstitially around and under the recurrent mass.

One month later the overlying skin showed irritative reaction and broke down so that a shallow ulcer developed with a grayish necrotic base.

In view of the progressive destruction ensuing without any apparent reparative process and the question in my mind as to the total destruction of the malignancy plus the apprehension of the patient who now had been under treatment and observation for 18 months, on May 31, 1932, under general anesthesia I did a radical wide excision of the tissues of the back, employing a high frequency knife, removing the tissues from the posterior axillary line almost to the spine and from the middle of the scapula down to the 10th rib, removing skin fascia and muscles to the ribs. This extensive denuded area was covered with vaseline impregnated gauze until a healthy granulation base was obtained. After weighing the relative merits of various types of skin grafting and permitting the wound to heal by scar tissue formation, a decision was made in favor of the latter procedure.

The pathological report dated 5-31-32 follows:

"Pathologic Diagnosis: Marked necrosis with hyalinization and acute inflammatory changes. Sections from periphery show no evidence of tumor cells.

"Description—Cross: The specimen consists of a triangular shaped piece of skin measuring 6x6 cm. in the greatest diameters, in the center of which is a 2.5 cm. in diameter firm area free of dermal covering, the periphery of which appears smooth and punched out, suggesting some surgical intervention. The central portion is firmer than the surrounding tissue and on section is gray-white and shiny. Several foul-smelling greenish soft areas are noted through this portion, and small slender bits of black shiny metallic material are scattered throughout the central mass. The underlying areolar and muscle tissues are attached." Otto Saphir.

Dr. Saphir made 147 slides from serial sections of the above specimen.

As will be noted, the ulceration was not of a malignant nature but resulted from the radiation, confirming the opinion expressed by Dr. Ewing.

No space will be devoted to the tedious healing process of the large denuded area. At present there is a scar over the area operated on of tissue paper thinness, freely movable over the underlying tissues. The scar area is roughly triangular in shape and now is contracted down to the size of a hand. The range of motion of the right arm and shoulder is normal and there is no incapacity. 5½ years after discovery of tumor the patient is in perfect health. He has been under my observation at frequent intervals up to the present date.

In addition to contributing one more report of a five-year cure of a neurogenic sarcoma, this case is instructive in that it distinctly emphasizes the observations quoted at the beginning of this paper, namely the importance of biopsy even in unrecognized and unsuspected malignancy, and

that adequate surgery and heroic x-ray and radium dosage offer excellent chances of irradiation of the disease.

The cooperation of Dr. Frank E. Simpson is appreciated and contributed in no small measure to the happy results in the above case.

310 South Michigan Avenue.

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### CRISIS IN ADDISON'S DISEASE SIMULATING CORONARY THROMBOSIS

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The object of this presentation is to report a case of Addison's disease, which clinically and electrocardiographically simulated coronary thrombosis. The essential features of this case are as follows:

A 41 year old male of Italian descent entered the American Hospital on August 3, 1936, in a marked state of collapse. A brief history revealed that the patient had not felt well for one week previous to admittance. His complaints at that time consisted of weakness, indigestion and shortness of breath. Because of these complaints he consulted a physician, who diagnosed anemia and who advised a high liver and meat diet together with some medication. The patient did not improve on this therapy and, on the day of his admittance, he collapsed at the hospital. His past history was negative with the exception of a cervical adenitis, most probably on a tuberculous basis, thirteen years ago.

Precursory examination at this time, revealed a well

developed male who appeared acutely ill. The skin was ashen gray in color, and was covered with a clammy sweat. The mental status was perfectly clear. The temperature rectally was 96.8, the pulse 88, the respirations 24, and the blood pressure was 70/30. The working diagnosis on admittance was shock of undetermined origin, and the possibility of a coronary thrombosis was considered. A bedside electrocardiogram was ordered and cardiac consultation was asked for.

Several hours later, in spite of all emergency shock measures, the patient still presented a grave syndrome. The facies still were ashen gray and the systolic pressure reading was about 60 mm of mercury. The heart sounds were almost inaudible, but the heart borders appeared within normal limits. Rales were present over both lungs posteriorly, but the apices were clear. The abdomen was scaphoid, not tender, and no rigidity was present. The liver edge was well under the costal margin. The extremities were cold, but no obvious edema was present.

Laboratory findings revealed that the urine had a trace of albumin. The blood showed a hemoglobin of 90%, the red blood count was 5,260,000 and the white blood count was 9,000. The blood Kahn was negative, and the blood sugar was 187 mg per 100 c.c. The electrocardiogram showed a normal sinus mechanism, with a low grade sinus arrhythmia. The rate was 71, and the PR interval was .18 sec. The significant changes were a Q3 of 6mm and large T waves in the first and second leads. There was a high takeoff of the RT segments in leads 2 and 3 as is frequently found in the early stages of coronary occlusion. The fourth or precordial lead was within normal limits.

From a diagnostic point of view, the diagnosis of coronary thrombosis did not seem to fit the picture entirely. The absence of sternal pain was troublesome in this case, still considering that cases of coronary occlusion without pain have been reported in the past. The electrocardiographic changes could not be explained by any confusing conditions such as pericardial effusion,<sup>1</sup> pneumonia or uremia<sup>2</sup> etc., which at times lead to the so-called coronary deviation of the QRST complex in conditions outside of coronary thrombosis. A flat non tender abdomen ruled out acute gastrointestinal pathology. The past history of a possible tuberculous cervical adenitis, the acute onset with weakness and gastrointestinal symptoms, the marked hypotension, suggested the antemortem diagnosis of Addison's disease.

In spite of all therapeutic measures, repeated doses of epinephrine per hypo, nearly one-quarter of an ounce in all of the 1/1000 solution, the blood pressure steadily fell and the patient quietly expired the same day of his hospital admittance. The delay in arriving at the proper diagnosis and the acuteness of the disease process prevented the use of cortical products, undoubtedly its use would have delayed the immediate fatality here.

Postmortem examination revealed marked caseation of both adrenal glands, with complete obliteration of all normal markings. Microscopic sections showed complete destruction of the cortex in both glands by caseation. The heart weighed 305 grams and was

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grossly normal; there was moderate atherosclerosis of the coronary arteries, but no evidence of occlusion was present.

The highlights and interesting features of this case are as follows:

1. The rapidity of onset of this disease. The total duration of symptoms being one week in the case presented above. The earliest onset previously reported was eighteen days in a case reported by Lippman.<sup>3</sup>

2. The fulminating shock mechanism that was present in this case is unusual, as most cases have an increasing period of weakness, which confines the patient to bed in the terminal stages. Our case was ambulatory to within a few hours of his death. However, sudden collapse after exercise with sudden death that has suggested coronary thrombosis has been reported in the monograph on Addison's disease by Rowntree and Snell.<sup>4</sup>

3. The confusing EKG picture is especially interesting. The most significant abnormalities consisted of large T waves, a large Q3 and elevation of the RT segments in leads 2 and 3. Coronary sclerosis was present at postmortem examination and most probably these changes were responsible for the abnormalities described. The rapid fall of pressure with a lowered coronary circulation theoretically may account for some of these changes.

In a series of 25 cases of Addison's disease studied electrocardiographically, Rowntree and Snell<sup>4</sup> reported 21 normal tracings; 2 cases had T wave negatively; 1 auricular fibrillation; and 1 incomplete bundle branch block.

Coelho<sup>5</sup> reports 3 cases in which the outstanding EKG changes are low voltage of all the complexes as is found in myxedema. He contends that these changes are due to a hypoplastic condition of the heart, and have no relation to the size of the heart; as the heart is large in myxedema and small in Addison's disease, but the cardiogram is the same in both diseases.

Frates<sup>6</sup> has studied 7 cases and he finds that in cases of moderate seriousness there is an increase of the T waves, which he believes is due to a compensatory excitability of the myocardium. Lengthening of the PR interval has been noticed at times and in the final stage of the disease, definite flattening and deformity of the T wave is seen.

In a series of 3 cases reported by Delius and Opitz<sup>7</sup> all cardiograms showed a definite deviation from normal, with evidence of myocardial involvement, and disturbances in conduction. An absence of cortical hormone leading to a disturbed circulation and disturbed metabolism of the heart muscle are the theory of these changes advanced by the authors.

4. The contention of animal experimenters, that the cortex of the adrenal gland is vital to life<sup>8</sup> is substantiated, and the failure of the medullary hormone epinephrine to bring about a remission is well demonstrated in this case. The use and availability of cortical products is vital in the treatment of Addison's disease.

5. Pigmentary changes are of great diagnostic importance, but may not have time to develop during the crises of this disease. The absence of these changes increased the difficulties of arriving at a proper diagnosis in our case.

6. The relation of sodium and potassium ions to the crisis of Addison's disease has been proven experimentally.<sup>9, 10</sup> A disturbed sodium balance due to a high intake of potassium salts in the diet has been held to be responsible for precipitating the acute crisis.<sup>11</sup> No accurate calculation for potassium content was possible in the case presented, but it is very probable that this patient had an increase of potassium salts in his diet for anemia, as foods rich in iron are rich in potassium, and this proved to be the trigger mechanism that precipitated the fulminating picture described above.

The author is indebted to Dr. Max Thorek of Chicago, for permission to study and report this case.

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## VITAMIN F OINTMENTS

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Most dermatologists agree that local treatment is effective in all cases of eczema, and in many instances no other treatment is necessary.<sup>1</sup> Various preparations are used locally, but ointments comprise the chief variety of the form in which medication is applied to the skin.

An examination of thirty prescriptions suggested in several texts<sup>2, 3, 4</sup>—discloses a preponderance in the use of zinc oxide usually incorporated in some paraffin preparation such as petroleum jelly. Occasionally, use is made of agents such as salicylic acid, phenol, resorcin, menthol, bismuth subnitrate, sulphur, or other substances intended to act as antiseptics, to alleviate itching, or to act as mild refrigerants; but the above prescriptions were lacking in any real anti-eczema factor from a causative standpoint. Certainly zinc oxide cannot be considered to bear any specific therapeutic relationship to this form of dermatitis. From all of which, it must be concluded that where eczematous lesions disappear, the credit cannot properly be applied to any particularly intelligent pharmacologic knowledge on the part of the physician, or to any mechanism which will withstand adequate pharmacologic explanation.

Since 1929, however, the experiments of Burr and his co-workers<sup>5</sup> seem to offer an entirely new interpretation of the nature of the most prevalent type of eczema, and together with that interpretation they offer at the same time a thoroughly sound and clinically effective therapeutic program.

Burr and his co-workers have shown that animals on fat starvation diets develop a variety

of symptoms which involve the epidermal structures and also seriously affect internal organs. The epidermal derangements include a dryness and roughness of the skin that eventuates in eczema; a seborrheic scurf; a loss of lustre and resiliency of the hair and nails which become brittle and split easily, the hair particularly showing a strong tendency to fall out. Internally, the symptoms definitely involve the pituitary gland; profound changes occur in the mechanism of labor and a form of sterility distinguishable from vitamin E deficiency may occur; but the most profound changes take place in the kidneys which undergo a severe nephritis usually so drastic as to be responsible for the inevitable death of the fat-starved animals.

Subsequent to the work of the Burrs, other investigators<sup>6, 7, 8, 9</sup> have offered complete corroboration of these findings and have further identified the ingredient in fats responsible for the Burr fat deficiency syndrome as an indispensable unsaturated fatty acid. Of this unsaturated fatty acid, McCollum and Becker write as follows: "It is indispensable to normal nutrition. A diet containing everything else which is essential but lacking in linoleic acid will fail to maintain life. It must, therefore, be provided in the food."<sup>10</sup>

Evans, Lepkovsky and Murphy have referred to this essential unsaturated fatty acid as vitamin F, and by that name it is today commonly recognized by many dermatologists who have experimented with its curious properties during the past few years.<sup>11</sup> It is important to know that these same investigators minutely described the form of sterility occasioned by vitamin F deficiency, a subject which has been reviewed in authentic biochemic literature recently.<sup>12</sup> On this topic Evans and his associates remark that in the absence of vitamin F, a failure in reproductive functions always results, marked by a peculiar and characteristic prolongation of gestation, apparently due to a derangement of the birth mechanism. It would be exceedingly important and perhaps illuminating to procure a detailed history of labor characteristics of the mothers whose infants develop refractory eczema. This is all the more significant by reason of the work of Hansen, which seems definitely to correlate vitamin F deficiency with the appearance of infantile eczema,<sup>13, 14, 15</sup> just as the work of Cornbleet and Pace appears to correlate



Besnier's prurigo with a deficiency of the unsaturated fatty acids called vitamin F.<sup>16</sup>

It has always been known since the time of Unna that the skin contains naturally an abundance of fat. Shepherd has recently re-examined the fat content of the various layers of the skin<sup>17, 18, 19</sup> and has not only confirmed the early work of Unna, and the subsequent work of other investigators, but has furnished two important considerations. First, Shepherd has emphasized the importance of the ratio of the skin lipids which, for the normal epidermis, are in the proportion of one part of cholesterol to one part of lecithin to three parts of total unsaturated fatty acids, among them vitamin F. Shepherd has next emphasized the value of restoring fats to the skin as nearly as possible in the proportion intended by nature for the prevention of the wide-spread dryness complained of by innumerable persons.

Other natural fats contain vitamin F, although in exceedingly variable amounts. For example, natural lard is a good source of vitamin F and is frequently used in biochemical laboratories to demonstrate the presence of vitamin F in food-stuffs.<sup>20</sup> In this connection it is interesting to observe that lard, plain or benzoinated, was at one time prevalently used as an official ointment base. It has been displaced by petroleum jelly which is totally foreign to the fats of the skin and may definitely hinder rather than aid the effectiveness of any ointment. There is much reason for believing that in the replacement of lard by petroleum in ointments for the treatment of eczema, the active ingredient, vitamin F, was eliminated and the base replaced by a totally ineffective substitute. This is not unlike the experience with official *sapo mollis* as reported by Glennon.<sup>21</sup> Linseed oil may be a source of vitamin F. It was officially prescribed for the manufacture of a soft soap. Later replaced with cottonseed oil, following which replacement so many protests of lost effectiveness were registered against soft soap as to have the pharmacopeal authorities restore the use of linseed oil. Glennon has shown that apparently the purposeful reinforcement of soft soap with adequately measured quantities of vitamin F confers uniformly excellent clinical effectiveness to the product.<sup>21</sup>

There is little doubt about the clinical value of proper vitamin F preparations in the treat-

ment of a variety of skin blemishes, including allergic eczema. This is quickly demonstrated in even a few clinical trials. But there seem to be various methods of so compounding the vitamin F as to prepare an ointment which shall serve as an excellent emollient, as a protective coat, as a gratefully acceptable fat to the injured skin, and as a vehicle for insuring the contact and ingress of vitamin F through those parts of the integument where its effective control of the skin lesions is made possible.

After considerable experimenting with a variety of fats, it became apparent that a mixture of the lipids of the assortment and in the proportion first shown by Shepherd to be valuable in creams intended for cosmetic purposes, served as a most excellent ointment. This may be compounded as follows:

Lecithin (40 point).....	2.5
Anhydrous lanolin .....	10.0
Vitamin F. concentrate (50,000 Shepherd-Linn units per gram).....	3.0

By 40 point lecithin is meant the vegetable lecithin obtained from soy bean and carrying 40% lecithin and 60% of a bland oil generally soy bean oil. The anhydrous lanolin should be assayed for its total cholesterol content, which may vary from a few per cent. to as high as fifteen. The samples with which we have worked most seem to show about 10% of total cholesterol. No attempt has been made to distinguish between combined and free cholesterol since there is very little evidence to support the conjecture that either one or the other is the more important when used in an ointment. By vitamin F concentrate is meant that form of linoleic acid which has been biologically standardized and is known to carry a definite titre determined by animal experiment, not less than 50,000 Shepherd-Linn units per gram.

Unstandardized sources of so-called linoleic acid must not be used, because, whereas all vitamin F is linoleic acid, not all linoleic acid is vitamin F. The reason rests with the fact that there are many isomers of linoleic acid, most of which are definitely known to be entirely without vitamin F effect. Vitamin F cannot yet be chemically identified but must be recognized through biological assay.

An inspection of the above formula will show that the ingredients have been compounded so as to furnish a fatty material containing lecithin

thin, cholesterol and unsaturated fatty acids with vitamin F in the proportion of 1:1:3. However, the material is inelegant and inconvenient for use in that particular form. To confer pharmaceutical elegance upon the product the consistency should be raised by the joint addition of suitable lard and beeswax, imparting to the fatty material the consistency of a satisfactory ointment. To accomplish this result the following prescription has been found typically satisfactory, but by no means the only one capable of formulation.

Lecithin (40 point) .....	7.0
Anhydrous lanolin .....	35.0
Vitamin F concentrate (50,000 Shepherd- Linn units per gram).....	11.5
Special lard (Hormel).....	46.0
Oil of peppermint .....	.5

To this base, sun-bleached beeswax may be added to procure satisfactory stiffening of the product. About 10% of beeswax seems to give the most desirable consistency.

There can be no doubt about the clinical effectiveness of such an ointment which, aside from its value in its present form, can serve perfectly well as a vehicle for whatever medication the physician may desire to incorporate therein. It has been our experience, however, that the addition of some medication may impair the effectiveness of the ointment in place of aiding. This ointment is not only specifically useful in allergic eczemas, but is valuable also in the treatment of burns from whatever cause such as erythema solaris, industrial burns and the like. It is interesting to recall that Carron oil has been very widely used for many years as a dressing for burns. Carron oil is a mixture of linseed oil and lime water, and there is much good reason to know that the active ingredient of Carron oil, which is at best a disagreeable preparation, is the calcium soap of the unsaturated fatty acids comprising vitamin F.

✓ Everyone is familiar with the increasing incidence of dry skins and allergic eczemas. There is little doubt that the purposeful suppression of all fats in the diet and the replacement of natural fats containing vitamin F with hydrogenated substitutes stands in etiological relation to this increasing incidence.

Vitamin F should be restored to the diet. Indeed, any careful observation is sufficient to indicate conclusively that the physician will see

many more individuals showing symptoms that can be attributed to vitamin F deficiency than he will see individuals showing equally outspoken symptoms attributable to all other vitamin deficiencies combined. Dryness of the skin, eventuating in eczema, brittle, lustreless hair filled with dandruff, tendency to falling hair, and brittle finger nails are more ubiquitously distributed than the xerophthalmia due to vitamin A deficiency; the paralysis due to vitamin B deficiency; scurvy due to vitamin C deficiency; rickets due to vitamin D deficiency; sterility due to vitamin E deficiency; or pellagra due to vitamin G deficiency. Vitamin F, unlike the other vitamins, with the possible exception of vitamin E, operates well if applied externally and equally well if administered internally.

The ointment proposed as a result of these studies and our experiences at the hospital, clinics and in private practice is merely an endorsement of the time-honored empirical lard with the conscious realization that the apparently active ingredient was the comparatively newly discovered and identified vitamin F.

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## COMBINED FULL TERM EXTRA AND INTRA UTERINE PREGNANCY

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In February, 1935, a woman patient of the Drs. Whitaker of East Prairie, Missouri, entered St. Marys Hospital. The essential items of her history were as follows: Colored. Age thirty-four years. One living child, seventeen years of age. No more pregnancies until six years ago and since then she had a pregnancy each year but each one was followed by a miscarriage at some period between the fifth and eighth months of gestation. Her last regular period was the May previous, approximately eight and a half to nine months ago. In June, she missed entirely. The



Fig. 1. Left, Intrauterine child.  
Right, extrauterine child.

latter part of June she started flowing and continued for almost a month. She has not had a period since that time. In September she started to have indefinite abdominal pains which have persisted during this time. For the past month she has been troubled with pains most of the time, of the character of labor pains. During this time she has also had nausea and frequent vomiting. For the past five days, her pains have been practically constant and very severe and such as to demand opiates.

On entering the hospital, she presented the following findings:

Head, neck, chest, heart, lungs, extremities and laboratory findings negative.

Two separate distinct sets of heart tones were present about the level of the umbilicus. Palpation of the abdomen was somewhat uncertain although on the right side a fetus was palpable with occiput down. The cervix was high up and pushed forward. I was barely able to reach the tip of my finger to the posterior lip which was wedged tightly up above the pubic bone. Apparently, there was one finger dilatation. There was a very marked bulging of the vault behind the cervix and such as resembled the usual large abscess in the cul de sac. There was no bloody discharge. Apparently there was a condition which was not amenable to normal delivery and the abdomen was opened. The uterus occupied the greater part of the front of the abdomen but primarily on the right side. Presenting on the left fourth of the abdomen in its entire length was a sac extending from the left wall of the uterus to the lateral peritoneal wall. This sac covered a large amount of fluid and a solid body. The uterus was opened and a baby removed and the sac on the left side of the uterus was also opened and the second child removed. It was found that the placenta of the extrauterine baby was adherent to the peritoneal covering of the left wall of the uterus by a vascular base. In view of the fact that attempted separation of this placenta was associated with severe bleeding, a hysterectomy was performed. It was found that the contents of this extrauterine sac extended deeply into the pelvis behind the uterus and this was the reason that the uterus was pushed high up.

Although the mother was quite weak when she came off the table, yet she rallied shortly and had an uneventful post-operative recovery. A Kahn test showed 4 plus.

An additional interesting factor in this case was the difference in the appearance of the two babies. The extrauterine baby was of fine, plump healthy appearance. The skin was entirely clear, the contour of the body normal in every way, eyes clear, a healthy cry and nothing pathological to find. It weighed four and three-fourths pounds.

The intrauterine baby weighed only three and a half pounds. Its appearance was that of congenital syphilis. The skin was wrinkled in parts, and in other places especially on the soles of the feet and hands, there presented a dry thickened scaly appearance. The eyelashes were coarse, the hair more sparse, a snuffle was present and both the liver and spleen were moderately enlarged. His cry was of a "whiny type" and it was listless to nursing. It is true that some of these findings may have been due in part to a difference in age of development but essentially they were those of syphilis. He passed away on the fifth day.

The extrauterine child progressed nicely and

continued a normal course during its stay in the hospital.

The following points appealed to me as being of especial interest:

1. Although there are reports of combined extra and intrauterine pregnancies, yet I know of no case having ever been reported in which both went close to normal gestation time.

2. The condition of the extrauterine child was of a normal healthy child, fully developed. The intrauterine baby was not up to par, with a congenital syphilis predominating the picture.

It would be conjectural whether or not the two fetuses were impregnated at the same time or whether the intrauterine was at a later date.

### CESSATION OF EPILEPTIC SEIZURES FOLLOWING RECOVERY FROM PROS- TATITIS; REPORT OF TWO CASES

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Some hesitancy is experienced in presenting another causative factor in epilepsy, either predisposing or exciting. Especially is this true when one is reporting only two cases, and in both of whom the relief of symptoms was observed and remarked upon by the patients themselves and not through the keen observation of the doctor. However, a urologist's opportunity for examining and following up cases of epilepsy are remarkably limited and one might be pardoned when one's particular interest is so far afield.

It is generally agreed that an inherent neuropathic or psychopathic tendency, to say the least, is present. Frequently a relative history in the collateral or antecedent members of the family is obtained; notably, psychasthenia, insanity and hysteria; sometimes a definite history of epilepsy itself, and not infrequently the kindred ailments of chorea, migraine, tic and hypochondria. Alcoholism is frequently referred to but is so common as to preclude an accurate evaluation of its role. Shock, either physical or emotional, is a commonly known agent provocateur. In physical shock or traumatism care must be exercised to distinguish from the symptomatic type in which there is definite organic injury to the brain or cord. Many other causal factors may be mentioned; reflex or peripheral irritation may awaken a slumbering epilepsy, phimo-

sis, indigestion and teething play a part in certain instances. The acute infectious diseases probably play an important part and even cause lesions of such small size in the brain as to go entirely unrecognized.

In females menstruation frequently assumes a stellar role, emotional stress, pain or physiological toxemia inducing seizures just before or during the period. This might be analogous to the following cases who were relieved and kept free of epileptic attacks by treatment of the accompanying prostatitis.

Case 1. S. A. H. referred by Dr. Glenn S. Nelson, March 25, 1929. Aged 34, single. He complained of a chronic gonorrhea of five months duration for which he had been treated at an advertising cut-rate clinic with no appreciable progress toward recovery. Urethral smears examined by Dr. Nelson were positive for gonococci.

His past history was relatively unimportant except that he had suffered epileptic attacks since the world war. At the present time these seizures occur on the average of every two weeks.

His general examination revealed a chronic pharyngitis; the pupillary reflexes to light were very sluggish. No glandular enlargement. The left knee kick was two plus, the right could not be elicited. The heart and lungs were clear. The blood pressure 110/78 m.m. The routine blood Wassermann report was returned negative.

Local examination revealed a moderate mucopurulent discharge containing many gonococci. On digital examination the prostate was large, full and round and quite firm. The median sulcus partly obliterated. The borders well defined. The seminal vesicles were moderately enlarged and mildly infiltrated.

He continued treatment regularly through May 27, 1929, when it was apparent to him that he had recovered from the gonorrhea, although he still had a mild chronic prostatitis.

He returned October 24, 1930, and stated that he came in for more prostatic treatment which had relieved him of the epilepsy previously but that the attacks had returned the past six weeks. In addition he complained of backaches and leg aches which were attributed to a chronic prostatitis. These, together with the epileptic seizures, have been controlled by occasional courses of prostatic treatment.

Case 2. R. A. referred by Dr. M. Owen Wilkins; aged 32, married ten years, no children although no contraceptives have been used.

He had acute urinary retention at age 6, cause unknown. Severe skull fracture at age 12 since when has had epilepsy. He was discharged from the navy at the age of 17 years at which time he was treated for a non-specific urethritis for three weeks with apparent cure. Soon after marriage, ten years ago, had increasing difficulty getting erections and the infrequent erections at the present time are unsatisfac-



tory although ejaculation does occur. The epileptic seizures occur two or three times weekly.

The complaints for which he sought relief at the present time are: perineal pain of several months duration, dead feeling of the hips, listlessness and lassitude, morning backaches and leg aches occurring any time during the day.

General examination was unimportant except for several bad teeth and blood pressure of 142/98 m.m.

Rectal examination revealed a greatly enlarged and soft boggy prostate and seminal vesicles.

Routine blood Wassermann was negative. Several teeth were later extracted.

He reported regularly for treatment and on December 10, 1935, volunteered the information that he had had no epileptic seizures for several weeks. The genitourinary symptoms had likewise disappeared and he reported irregularly for treatment, the last April 12, 1936.

No significance was attached to the statement of the first patient that his epileptic seizures ceased following prostatic treatment; but was considered rather as a coincidence. However, when the second patient volunteered the same information the experience of the first patient with recurrence and cessation following a subsequent course of prostatic treatment was recalled to mind; and it was concluded that more than a mere coincidence was at hand.

*Summary:* Two patients who sought relief for the symptoms of prostatitis and seminal vesiculitis likewise noticed a cessation of the epileptic seizures to which they had formerly been subject.

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## INDICATIONS FOR GASTROSCOPY

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In the past two years, a number of interesting and valuable articles on gastroscopy have appeared in American Journals,<sup>1-21, 26</sup> but as none of them have dealt solely with the indications, this paper will confine itself to this subject. The physician who has read the special periodicals and the Journal will well know that patients with esophageal obstruction, high gastric obstruction, esophageal varices, aortic aneurysm, excessive dyspnea, extreme kyphoscoliosis, advanced weak old age, or extreme arteriosclerosis and hypertension should not be gastroscoped but may ask: When *shall* a patient be gastroscoped?

Since the invention of the safe flexible Wolf-

Schindler instrument in 1931 gastroscopy has become a pleasurable procedure for both gastroscopist and patient. The patients cooperate fully, receive no general anesthetic, suffer no pain during gastroscopy nor afterwards. At the most an occasional sore gum or throat is complained of—the patients, if ambulant, are ready to return to their daily routine immediately afterwards. If hospitalized, even the very weak find gastroscopy no great strain. Recently a woman who had had a sub-total thyroidectomy for hyperthyroidism was gastroscoped 8 days after thyroid resection without discomfort. She has since returned for a second gastroscopy to follow the course of healing of her gastric ulcer which she also had. All these patients return gladly, even eagerly, for gastroscopic check on their gastric ulcers. This attitude contrasts with that of patients toward bronchoscopy and cystoscopy.

Since the patient finds gastroscopy a comfortable procedure, the indications, gathered from observation of nearly 500 cases,\* may be listed unreservedly:

1. Any patient with an obscure abdominal complaint, who has had negative physical, laboratory and x-ray study should be gastroscoped. A gastric lesion too small or too shallow to be seen with x-ray may be present.

2. Anyone with digestive symptoms, "dyspepsia," who has been called neurotic, should be gastroscoped before being sent to the psychotherapist. Such a patient may have atrophic gastritis or even early carcinoma.

3. Likewise, a patient with unexplained loss of weight, loss of appetite or nausea, may have an early gastric lesion and should be gastroscoped.

4. Unexplained hematemesis or melena constitute definite indications for gastroscopy. Very small shallow actively bleeding gastric erosions may be found or large mucosal hemorrhages. These latter may arouse the first suspicion of abdominal purpura.

5. A patient who has a positive x-ray, i. e., one in whom gastric or duodenal x-ray pathology has been found, should be gastroscoped for a number of reasons:

- (a) To confirm a difficult diagnosis.
- (b) To confirm a doubtful diagnosis.
- (c) To aid in the differential diagnosis be-

\*At Billings Hospital, gastroscopic clinic of Dr. R. Schindler.

tween malignant and benign gastric ulcer. Definite differences in the gastroscopic appearance of the floors of these ulcers may be found.<sup>22, 23</sup>

(d) If a positive clinical diagnosis of gastric carcinoma has been made, to aid in determining its resectibility, when no metastases have been found in tissues elsewhere. Carcinoma with sharply defined edges, localized in a favorable region in the stomach, should be resectible. Mucosal edges infiltrated by carcinoma more widely than is apparent by x-ray, or implants situated in the gastric mucosa, near or at some distance from the primary, and still too small to be seen by x-ray, will offer a less favorable prognosis for removal and may change the therapy from operation to roentgen ray.

(e) After a clinical diagnosis of duodenal ulcer is made, in order to determine whether the patient has additional gastric pathology. The duodenal lesion, of course, cannot be seen through the gastroscope, but a duodenal and gastric ulcer have been known to occur in the same patient and the latter found only by gastroscope. Or, a gastritis may accompany duodenal ulcer, as it frequently does. Severe gastritis will certainly influence the prognosis and duration of therapy for the ulcer.

(f) Patients in whom pyloric obstruction is found. Before operation for the obstruction, the surgeon should know the extent of the gastritis which is usually present and should inform the patient of the probable need of additional medical therapy. The gastroscopist can also aid in determining the cause of the obstruction, whether cancer or ulcer, and thereby facilitate the sometimes difficult choice between gastrectomy and gastroenterostomy, so important to patients weakened by vomiting and undernutrition.

6. Any patient in whom gastritis has been diagnosed or clinically suspected. Gastroscopy is the only exact way of making this diagnosis. *Very* exceptionally x-ray can correctly demonstrate chronic hypertrophic gastritis in its severest forms, not otherwise. Clinicians were handicapped for years in the diagnosis of chronic gastritis, for lack of proofs of its existence in the living patient, until the gastroscopists demonstrated its frequent occurrence.

7. Any patient for whom exploratory lapa-

rotomy is contemplated. The "exploratory," in contemplation always disappointing to patient and in retrospect frequently so to the surgeon,<sup>24</sup> may thereby be transformed into a therapeutic operation or be avoided altogether.

8. Gastrectomized patients should be gastroscopied at regular intervals after operation, in order to determine, as early as possible, whether there is a recurrence of the original lesion. If we wait for recurrence of symptoms, it is usually too late to do anything further.

9. After gastroenterostomy, at regular intervals. If symptoms persist or recur, patients will usually be gastroscopied promptly, but gastroscoping them soon after gastroenterostomy and perhaps every three months for a year, before onset of symptoms, should uncover early any developing gastrojejunal ulcer or the gastritis which is so prone to occur in these stomachs, perhaps due to incorrect functioning of the new opening. Medical treatment or further surgery could thereby be instituted much earlier.

10. Patients with blood dyscrasias should be gastroscopied. Pernicious anemia is accompanied by all grades of atrophic gastritis and has been shown to yield to liver therapy.<sup>5</sup> Polypoid carcinoma, which may be accompanied by macrocytic anemia, can be missed by x-ray, unless the most careful compression technic is available.

11. Patients with known atrophic gastritis should be gastroscopied at regular intervals. It is thought by some to be the forerunner of gastric carcinoma.<sup>22</sup>

12. Patients in whom the rarer lesions of the stomach may be present. Too little is known, before post mortem, of gastric tuberculosis, syphilis, lymphoblastoma<sup>14</sup> and other granulomas. Lesions of these diseases, primary elsewhere, may suggest because of the patient's symptoms involvement of the stomach.

13. Lastly, there is the very important indication of the gastroscopic follow-up *during therapy* of gastric carcinoma, gastric ulcer and chronic gastritis.

Roentgen therapy, in recent years, has been employed for certain types of gastric carcinoma. The estimation of amounts of therapy, of repetition of courses of therapy, of effect on the lesion by a particular course of therapy has been greatly handicapped by our indirect methods of viewing the lesion. Gastroscopy offers the direct



visualization of gastric cancer that we now have of skin or cervix uteri lesions, by reason of their open position. Similarly, our check on the healing of gastric ulcer, during medical management, has been limited to x-ray. The symptoms of the patient recede some time before disappearance of the x-ray crater. The latter has been our best criterion of healing. The gastroscope demonstrates that these ulcers remain unhealed, though they become very shallow, after the x-ray becomes negative.<sup>20</sup> The end process of healing through scar formation and complete epithelialization is the stage which the gastroscope only can reveal and which can give the clinician and the patient confidence that treatment may be stopped. Thirdly: the gastroscope only can disclose the effect of treatment on chronic gastritis. These inflammatory lesions, with or without shallow erosions, elude the roentgenologist. It will eventually be the gastroscopist, who will decide the effectiveness of any therapy of gastritis.

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#### PROBLEMS OF PNEUMOTHORAX THERAPY

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Reviewing the history of pneumothorax therapy, we find that its value in the treatment of pulmonary tuberculosis, was slow in receiving general recognition. Favorable reference to the procedure by so strong a personality as John B. Murphy in 1898<sup>1</sup> was apparently too premature to create any great amount of interest in its therapeutic application. As late as 1929, in an address before the American Association for Thoracic Surgery, in a discussion of induced paralysis of the diaphragm, the statement was made that "pneumothorax properly induced and repeated will provide an inconstant reduction in intrapleural negative pressures. It creates a lesion, a cavity filled with an irritating gas. Instead of effecting a natural and dangerless adaptation, it imposes an abnormal state, not without danger, that is less beneficial."

The present regard for pneumothorax therapy as contrasted with the indifference toward its value for so long a period is of more than passing interest. Why this procedure which frequently lends itself so ideally to the cure of pulmonary tuberculosis, should have been so tardy in receiving general acceptance, may in a measure be evident upon consideration of the problems involved in its successful application. Their manifold and complex character and the difficul-

<sup>1</sup>Read before Chicago Tuberculosis Society, Feb. 18, 1937.

ties attending their satisfactory solution are familiar to the phthisiotherapist. The present status of pneumothorax treatment is based upon a better understanding of these inhibitory factors, increased knowledge of which may serve to further enhance its therapeutic possibilities.

*Indications for Pneumothorax Therapy.* The tendency to limit the indications for pneumothorax therapy has been largely responsible for its failures. Originally employed in unfavorable cases, recent years have witnessed a more liberal attitude toward its use. Delay in its application continues to retard its therapeutic potentialities.

A definite diagnosis of active pulmonary tuberculosis should demand early consideration of pneumothorax in the plan of treatment. In the presence of positive sputum or repeated hemoptysis there is little point in waiting to see whether an active lesion will recede or advance or if a cavity will decrease in size. The observation that some patients improve without the benefit of pneumothorax is not an adequate reason to delay its application. A wealth of statistics confirms the fact that conservative measures in patients with positive sputum fail to compare in any manner at all favorable, with the results of this type of lung compression.

With the exception of chronic fibroid tuberculosis, bilateral bronchopneumonia and miliary involvement, pneumothorax offers the patient the best chance of cure both in unilateral and bilateral involvement. The striking results not infrequently observed in the latter type of cases, even in the presence of advanced cavitation constitute an outstanding achievement in therapy. Its prompt use in unilateral tuberculous pneumonia may be a life saving measure.

*Limitations.* Pneumothorax has its limitations. No free pleural space may be found. In the greater number of patients the character of the collapse is only partially satisfactory and in many instances of no definite value from a therapeutic standpoint. Its use does not permit exclusion of the conservative measures which have proved to be of value.

The use of pneumothorax in the individual patient must of necessity depend upon the judgment of the clinician. Differences of opinion exist with regard to the advisability of its application in exudative lesions in the absence of cavity formation. The importance of these diver-

gent views lies in the fact that air induction is in many instances delayed to the disadvantage of the patient. It has been often observed that x-ray plates taken immediately after pneumothorax reveal that a lesion regarded as purely exudative shows definite areas of cavitation.

Pneumothorax therapy has no place in the presence of circulatory or respiratory involvement associated with more or less permanent dyspnea. While the presence of severe complications such as advanced laryngitis, enteritis and genito-urinary disease may contraindicate its use, we not infrequently observe a salutary effect upon these conditions. I might state that patients under pneumothorax treatment are apparently less prone to develop the complications mentioned.

*Progress in the Untreated Lung.* The effect of pneumothorax on the untreated lung is problematical. No definite changes are apparent in the larger number of patients. In bilateral involvement, especially in old chronic cases, a decided improvement may occur in the other lung. In relatively few patients, usually in the presence of an unsatisfactory collapse and more often in bilateral cases, the progress in the untreated lung is unfavorable. It is difficult to analyze the factors controlling the phenomena in the contralateral lung in the individual case. In some instances the unfavorable manifestations appear almost immediately; in others they may be long delayed. It is questionable whether pneumothorax itself has any direct bearing upon the development or the progress of the disease in the untreated lung.

*Adhesions.* The problem of adhesion formation is closely interwoven with the success or failure of pneumothorax therapy. Adhesions not only interfere with favorable lung compression, but constitute the chief cause of the complications which may develop during treatment. Adhesions are found in the majority of patients treated. G. L. Stivers in a recent article<sup>2</sup> presents an insight into the problem of adhesions and their role in preventing satisfactory artificial pneumothorax. He summarizes the average results of compression in 100 cases as follows:

10 cases—complete collapse—satisfactory.

10 cases—selective collapse—satisfactory.

20 cases—partial collapse—eventually may be satisfactory.



20 cases—incomplete collapse—unsatisfactory—pneumothorax given only to prolong life.

15 cases—unsatisfactory collapse—unsuitable for intrapleural pneumolysis—other surgery indicated.

3 cases—accepted for intrapleural pneumolysis but found unsuitable at time of thoracoscopy.

22 cases—declared appropriate by thoracoscopy for intrapleural pneumolysis.

These statistics show that at least 60% of patients were unable to benefit by pneumothorax alone and that adhesions constituted a problem in about 80% of cases.

The favorable results of pneumothorax therapy in the absence of adhesions as contrasted with the limitations of the procedure in their presence, have given impetus to the development of pneumolysis, the discussion of which is not within the scope of this paper.

It would seem desirable to consider the question of interference by adhesions from the standpoint of prevention as well as treatment. The fact that most patients are far advanced when a diagnosis is made, combined with the frequent delay in the application of pneumothorax, may have an important bearing on the problem. Adhesions have had ample time to become firm and well organized. Earlier diagnosis or at least early use of pneumothorax would tend to favorably influence the situation. A relatively short period of waiting may determine the difference between an adhesion which will stretch sufficiently to permit of a satisfactory collapse and one which will not.

Cavities located in the periphery of the lung should be collapsed at once. Their marked tendency toward adhesion formation and the likelihood of these adhesions to interfere with satisfactory compression as the cavity increases in size has been often observed. Thin walled cavities located near the pleural surface are always accompanied by a localized pleuritis. The thickened pleura may mask the outlines of the cavity so that an x-ray plate taken subsequently may leave the impression that the cavity has healed, only to reveal in later films that the observation was incorrect and that cavitation has progressed. The pleural adhesions have had ample time to become well organized and compression is not only impossible but dangerous.

A more radical attitude towards the use of pneumothorax before cavitation has occurred may minimize the possibilities of interference by adhesions. A moderate collapse may be suffi-

cient under such conditions to obtain a favorable result. This may be accomplished even in the presence of thick well organized bands. With cavitation, however, compression must permit of cavity closure to attain the desired result. It is here that adhesions play an important role. The larger the cavity, the greater the possibility of failure resulting from progressive adhesion formation.

The handling of adhesions which prevent a satisfactory collapse is a delicate matter. High tension pneumothorax should as far as possible be avoided. It is the chief cause of complications which often terminate fatally. In the absence of positive intrapleural pressures, when adhesions prevent the proper compression of a cavity it may be advisable to continue air induction for a period of three months before direct treatment of the adhesions is undertaken. If adhesions prevent cavity closure it is unwise to continue pneumothorax indefinitely. Supplementary measures must be employed to facilitate compression.

*Pleural Exudates.* Serous exudates are usually observed during pneumothorax treatment. As a rule the amount of fluid is insufficient to cause respiratory embarrassment and the constitutional symptoms are relatively mild in character. As long as there is a negative pressure in the pleural cavity, air should be administered, regardless of the effusion. If the intrapleural pressure becomes neutral or positive the fluid should be removed and replaced by air. The tendency not to disturb large effusions in the absence of symptoms or discomfort based upon the idea that they maintain compression the same as air, may interfere with the success of the treatment. A thickening of the pleural surfaces with gradual absorption of the exudate may mask the expansion of the compressed lung, leading to an obliteration of the pneumothorax cavity.

*Acute tuberculous pleurisy* is a serious complication. The high fever and other constitutional symptoms may continue for many weeks to the marked disadvantage of the patient. Removal of the fluid is usually followed by improvement which, however, may only be transient in character. The condition usually terminates in pyopneumothorax. If the pneumothorax cavity does not communicate with a bronchus, the course of the latter condition is frequently favorable. Removal of the purulent exudate

and the injection of small amounts of sterile olive oil has been followed by recovery. If a bronchial fistula is present the situation is more difficult.

I shall not discuss the question of endogenous or exogenous infection in connection with pleural exudates except to state that the probabilities are, that these conditions are endogenous in origin and that high tension pneumothorax, whether due to the administration of excessive amounts of air or undue strain upon adhesions may be a factor in their cause.

*Technic.* It is not my intention to elaborate upon the fundamentals of pneumothorax technic aside from discussing its possible relationship to the occurrence of pleural shock, air embolism, spontaneous pneumothorax and surgical emphysema. A proper appreciation of the elementary principles of pneumothorax administration should accomplish much in the elimination of these hazards.

A cautious and deliberate approach along with the generous use of local anesthesia is essential in every case. Every effort should be made to render the procedure painless, beginning with an intradermal wheal and continuing with a slow infiltration of the deeper tissues until the parietal pleura is anesthetized. The syringe should at all times contain novacaine solution. The free entry of air into the syringe is at once apparent and the basis of any interference easily determined. Adherence to this simple method of thoracentesis will in the majority of instances eliminate the syndrome of circulatory collapse ascribed to pleural shock and will materially lessen the possibility of air embolism. It would seem unnecessary to advise that no air be given unless the manometer shows a definite and repeated negative excursion of at least three c.m. of water. The several cases of air embolism which I have seen, occurred in connection with an attempt to induce a little air in the absence of a definitely negative reading.

With the exception of treatment of hemoptysis it is desirable to administer small quantities of air at frequent intervals rather than large amounts. A positive manometer reading even in the presence of a good negative pressure should always be regarded as a danger signal. Positive pressures may mean tension on adhesions, and tension on adhesions may result in tears of the lung with consequent air embolism or spontane-

ous pneumothorax and its resulting complications.

Factors concerning the efficiency of pneumothorax must be recognized and carefully evaluated. In this connection, frequent fluoroscopic examinations and x-ray plates are indispensable. The basis of symptoms arising during treatment should be ascertained. They may be the forerunners of serious complications.

Under satisfactory circumstances, pneumothorax should be continued for at least 3 years. In a previous publication,<sup>3</sup> I stated that "artificial pneumothorax once established, should be maintained as long as the pleural space permits of the injection of air under negative pressure." I am still inclined toward this opinion.

#### CONCLUSIONS

Pneumothorax when applicable is the most desirable and efficient method of lung compression. Its prompt use in positive sputum cases and in repeated hemoptysis due to pulmonary tuberculosis should be encouraged.

Tardiness in its use has been largely responsible for its failures.

Early diagnosis and the early use of pneumothorax will favorably influence the solution of the problem of adhesion formation and its interference with satisfactory lung compression.

Careful and painstaking technic will avoid many accidents and complications.

The phthisiotherapist is now in position to offer a constructive plan of treatment in the individual case as well as an improved prognosis. This has resulted from the wider appreciation of the therapeutic value of pneumothorax therapy and other methods of lung compression developed as a corollary to its use.

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#### PERNICIOUS ANEMIA SIMULATING LEUKEMIA

*Specific Response to Parenteral Liver Extract*

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The differential diagnosis between the early stage of severe anemias and acute forms of leu-



kemia is frequently very difficult. Acute leukemia may be accompanied by or even preceded by a severe and rapidly progressive anemia. Pernicious anemia is usually accompanied by a normal or slightly decreased leucocyte count and at times by a relative increase in lymphocytes. Rarely cases of Addison anemia have been reported with many premature cells. In the case here reported the initial picture was that of a severe anemia with a high color index and an accompanying finding of a subleukemic myelosis. The parenteral administration of liver extract rapidly changed this picture and caused a disappearance of the premature white blood cells with a good reticulocyte response and regeneration of red blood cells as is so characteristically found in pernicious anemia.

#### REPORT OF CASES

A white woman, M. R., 34 years old, married, two children, entered the Grant Hospital, January 23, 1933. Her past history was essentially negative. Several months prior to entrance she had a period of weakness followed by complete recovery. Since December, 1932, she had become progressively weaker and had been bedridden for the previous three weeks. There was a ten pound loss of weight. Two weeks before entrance she developed an irritative non-productive cough. For the last few days she vomited continuously and could retain no food or medication and very little water. There was a pallor with a slight yellow tinge. The tongue was smooth and pale but there was no burning or soreness. Roentgenological examination of the teeth showed several rarefied areas at apices due to apical abscesses. Heart was enlarged and loud hemic murmurs were heard. There were many moist rales at the bases of lungs. Nothing abnormal could be felt in the abdomen. The spleen was not palpable. There were mild symptoms of paresthesia in the legs but the reflexes were normal. Temperature varied from 100 F. to 102 F. Weakness was extreme and this coupled with difficulty of retaining food made the patient appear in extremis.

*Examination of blood:* The blood count showed erythrocytes 1,000,000, hemoglobin 30%, leucocytes 9,100, polymorphonuclear neutrophils 34%, metamyelocytes 6%, promyelocytes 13%, eosinophiles 1%, myeloblasts 5%, lymphocytes 37% and monocytes 4%. Poikilocytes, megalocytes and polychromatophiles were present in large numbers. There were 53 normoblasts and 11 erythrogonias to 100 white blood cells.

Dr. Richard Jaffe wrote the following comment: "Marked anisocytosis and poikilocytosis. Many polychromatophiles and basophilic stipplings. The myelocytes are very large. This is the blood picture of subleukemic myelosis."

Gastric analysis showed no free hydrochloric acid and this finding has persisted up to the present time.

Before entering the hospital she had tried to take some liver extract but had been unable to retain it.

The severe anemia with high color index, achlorhydria, smooth tongue and slight parasthesia of the legs suggested the diagnosis of pernicious anemia. The large number of premature white blood cells presented the picture of a subleukemic leukemia. The possibility of a malignancy affecting the bone marrow was considered but x-ray examination of several long bones showed normal structure.

On January 25 an intramuscular injection of 2 c.c. of liver extract equivalent to 30 grams of liver, was given and repeated January 27 and daily thereafter throughout the patient's stay in the hospital.

A week after beginning treatment the hemoglobin was 40% and the red blood count was 1,600,000. There were 19 normoblasts and 3 erythrogonias to 100 white blood cells. The reticulocyte response was 9%. The leucocyte count was 11,000 with polymorphonuclear neutrophils 57.6, metamyelocytes 6.4, promyelocytes 1.6, basophiles 0.8, lymphocytes 28.8 and monocytes 4.8.

February 4 the hemoglobin increased to 50% and the red blood count to 1,560,000. The patient felt much better and could retain food. There were only 3% premature cells and in all the subsequent blood counts, none were found.

From this time on steady progress was made and by the sixth week after onset of treatment the patient was out of bed. Her hemoglobin was 65% and the red blood count 3,400,000.

After leaving the hospital she returned to the dispensary and was given a weekly injection of liver extract equivalent to 30 grams of liver extract until her hemoglobin returned to 75% and the red blood count to 4,260,000.

At this point it remained stationary from week to week. As some mild nervous symptoms were still present and as a normal count is apparently necessary to control these, the weekly injections were increased to an ampule equivalent to 100 grams of liver extract. This caused practically no change in the blood count.

Following one injection a reaction occurred. Almost immediately after the needle was withdrawn, the patient became pale and complained of a terrific headache. The systolic blood pressure fell to 102 and the pulse was rapid and small. An injection of adrenalin and  $\frac{1}{4}$  grain of morphine was given with relief of symptoms in ten minutes. This was followed by severe vomiting and then apparently complete recovery with no recognized after effects.

Since this time she has continued to take liver extract per mouth. The red blood count averages about 4,220,000 and the white blood count from 8600 to 9100 with a normal differential count.

In April, 1934, she finally consented to having her teeth extracted and six large apical abscesses were found. The removal of this large source of infection did not alter the blood count in any way.

In October, 1934, the liver extract was stopped and the blood count carefully watched. It remained stationary for five weeks and then fell gradually but progressively to 3,800,000. At this point the liver extract was again resumed and has been continued since.

The erythrocyte count July 31, 1936, was 4,980,000 with 82% of hemoglobin. The higher recent count followed the use of liver extract with stomach extract.

*Comment.* Although the initial picture is not characteristic, the progress of this case and the response to liver is similar to that of pernicious anemia. Brugsh and Nagelbach have reported a case of pernicious anemia in which the administration of liver was followed by the appearance of very immature white cells in the peripheral blood. This phase was of short duration. So little liver was retained when first given per mouth, it is doubtful if this factor could be responsible for the unusual blood picture in the present case.

Before the administration of the parenteral liver the patient's condition appeared hopeless. After its administration the improvement was rapid and progressive and all of the premature white cells rapidly disappeared.

#### SUMMARY

1. A case is presented of a macrocytic anemia with an associated picture of a subleukemic myelosis.

2. Oral administration of liver extract was unsuccessful and had no effect on the rapid unfavorable progression of symptoms.

3. The parenteral administration of liver extract led to a rapid remission and disappearance of all premature white cells.

4. A reaction to intramuscular liver extract is reported. ✕

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#### A PTERYGIUM OPERATION

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Back in the early nineties, when Dr. Fred Hotz was doing plastic surgery with skin grafts to rebuild deformed eye sockets, he suggested to me that the same kind of skin graft might be used to get rid of pterygia. I thought the idea a good one, and as I had poor success with other operations, I proceeded to develop the one described below.

The objects to be obtained are two: one, to get rid of the tumor, and the other to restore the clear cornea. Both objects were accomplished at my first attempt. Dr. Gifford of Omaha used mucous grafts from the mouth, but I did not find them as good, as it often left a thin film on

the cornea which in effect was a return of the tumor, a false one. As the mucous graft is of the same kind of tissue, it climbs right back. There is one objection to the operation, and that is at one step where it is much more difficult to perform than many others. But an eye surgeon with ordinary operative ability can perform it successfully. I would suggest that he cut several grafts before he tries it on a patient as it must be very thin to obtain the best results.

Grasp the tumor by its head and dissect it back to the corneal edge being careful not to dissect back at the upper and lower corners stopping at the conjunctiva, as any space left at these points will allow the tumor to crawl around on to the wound and cause a return of the pterygium. I have had this occur to my sorrow, requiring a start over again. Dissect the tumor at the center slightly when it will retract nearly to the sulcus, leaving an exposed sclera. Now select some spot on the patient's body where there are few hairs, though this is not essential as we do not cut into the hair bulbs. I usually select behind the ear, or a good point is the back of the ear. Some times I have gone to the inner side of the thigh. Shave off the horny layer only, keeping the graft on the razor and cut a curved section which is to come next the cornea when placed on the exposed sclera. Drop a drop of water on the graft so that it will slip off the razor onto the sclera, tucking the graft at the corners slightly under the conjunctiva, smooth down the graft carefully. A good assistant is very necessary from now on to the end, as he must hold the graft in place while the sewing is done. I have found a stabismus hook the best for holding the graft in position. Have a half curved needle threaded with not too coarse silk thread. Grasp one of the corners of the skin at the back, raise it carefully so as not to let the graft slip and turn over as it is impossible to recognize the upper side to replace it. I find it helps in the passing of the needle to have the assistant grasp the graft opposite your hold. If the accident of a turnover occurs you must cut another graft. I have had this occur by the carelessness of the assistants holding. Pass the needle through the graft between the two holdings and on under the conjunctiva diagonally upwards and backward well to the sulcus and tie not too tightly but enough to keep the graft from slipping onto the corneal wound. Do the same



with the other corner. This is not to hold the graft onto the sclera but to anchor it so that it will not slip onto the corneal wound. Smooth down the graft carefully so as to be sure it is where you want it. Now clean the wound of the cornea of all tags. You now have placed in front of the pterygium a tissue different from the tumor and it cannot crawl back. The graft the next morning will have a pretty pink look if you have a thin graft. You may now remove the stitches if you desire.

The graft will soon begin to shrink to a mere point at the corneal edge or entirely disappear. If too thick you may have to dissect it off later on. The cornea will regenerate itself and in time the eye will look perfectly normal.

To illustrate what can be accomplished, I will report a few cases. My first one was an old man from the country, with pterygia on the outer portion of each eye and they had grown so far onto the cornea that it obstructed vision. I removed them by the method described with perfectly clear corneas for both eyes. The next one was a merchant from Lake Geneva with an advanced pterygium of the left eye that had been operated on unsuccessfully before. The result was so perfect that several months later when I wanted to show it to another patient I had to ask the merchant which eye I had operated on. The most interesting case is one that I operated on in Mexico for a doctor there. He had the man, a poor peon, brought to his office. He had tumors on both eyes which had grown to the pupils and made him blind so that he had to be led to the office. I operated on one eye and when I returned from a trip into the mountains the man came to the office alone. I left the other eye for the doctor to do, but he wrote me later that the one operation was so successful that he was afraid to do the other eye.

I have done a number since and have had no failures. So far as my experience goes, I believe that it is the only operation of choice, especially for large pterygia.

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## SOLITARY CYST OF THE KIDNEY

### Discussion and Case Report

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Cysts of the kidney present a variety of symptoms, depending on their size, character and relation to adjacent structures. They are for the most part of congenital origin and vary in size from small pea-size cysts, such as those found in the course of chronic nephritis, to the enormous

dimensions of the solitary cyst. These latter become so huge that at times they may be palpated through the abdominal wall.

Cysts of the kidney are of clinical importance chiefly because of their ability to simulate other intra-abdominal conditions. They may increase in size, gradually pushing forward the posterior peritoneum and becoming adherent to various intra-abdominal structures. Inflammatory changes frequently occur and produce symptoms referable to the viscus to which they are adherent.

For the sake of convenience cysts of the kidney have been divided into the following classifications:

1. Minute cysts of congenital origin.
2. Large single cysts, or so-called "Solitary Cysts."
3. Congenital polycystic disease.
4. Blood cysts.
5. Para-pelvic cysts.

*Minute Cysts of Congenital Origin:* These are very small, may be single or multiple, and are seen either on the kidney surface alone, or may occur in the deeper portions of the parenchyma. Some are of congenital origin, while others occur in cases of chronic nephritis. Lubarsch believes that the majority are retention cysts, whereas Ribbert thinks they are all of congenital origin.

*Solitary Cysts:* These are of congenital origin and are of clinical interest because they may simulate not only intra-abdominal pathology, but also a renal neoplasm. They are usually unilateral, but may occur in both kidneys. These cysts vary in size from a hazel nut to one containing twelve liters. The average size, according to McKim and Smith is 15 c. They are more frequently found at the lower pole, but may occur at the upper. They are thin walled, in intimate contact with the adjacent parenchyma and contain a serous fluid. In the majority of cases there is no compression or distortion of the calices or pelvis of the kidney. In certain instances the cyst may attain a sufficiently large size to compress the pylorus or colon. Usually there is no communication between the cyst and renal pelvis.

*Polycystic Kidney:* In this condition, the kidneys are usually larger than normal and are sometimes enormous. Grossly, the kidney surface is irregular, due to numerous underlying

cysts. On section, many cysts are seen interspersed with small areas of normal appearing kidney parenchyma. Several theories have been advanced regarding their formation, the most commonly accepted being the view of Hildebrandt, who based his conclusions on our present day conception of the dualistic formation of the uriniferous tubules. He believed that cyst formation is due to a failure of union between the collecting tubule and the metanephrogenic anlage, and that with the beginning of secretory activity of the glomerulus and kidney tubule a cyst is formed. This view was confirmed by Ribbert, Meyer and many others and is today the most generally accepted theory of the formation of polycystic kidney.

*Blood Cysts:* Judd and Simon collected fifteen cases of hemorrhagic cyst of the kidney. They state that blood cysts differ from solitary cysts chiefly by their contents. The fluid of a solitary cyst is clear and serous, whereas that of a blood cyst is thin and brownish in color. In one case described by Judd and Simon, a mass could be palpated over the left kidney region, the cyst was located at the lower pole and contained 700 cc of thin brownish fluid. These cysts resembled solitary cysts both clinically and pathologically.

*Parapelvic Cysts:* Haslinger reported an unusual case under the title of "Multilocular Cyst of the Kidney." There were recurrent attacks of colicky pain accompanied by oliguria. One could palpate a fist sized mass over the right kidney. A preoperative diagnosis of intermittent hydronephrosis was made because of the evidence of pelvic retention. At operation a multilocular cyst was found apparently arising from the renal pelvis. The cyst contained a thin brownish fluid, measured 9 cm. in diameter and had a narrow pedicle. Haslinger believes it to have had its origin in some persistent tubules of the mesonephros.

The following case presented an almost perfect clinical picture of acute appendicitis, and so definite were the symptoms and signs that only a fleeting thought of differential diagnosis was entertained.

Case 1. C. B. H., aged 34 years, white, male, gave the following history: He had been in excellent health until about one and one-half hours after eating his evening meal when suddenly he began to experience cramp-like pain in the epigastric region. The pain

became rapidly more severe and approximately two hours from the onset shifted to the lower quadrant. At no time was the pain referred to the lumbar region, nor did it radiate to the testicle. When seen, in addition to the pain, the patient complained of nausea and stated that he had vomited once.

Physical examination revealed exquisite tenderness over McBurney's point. There was an increased muscular resistance to deep pressure over this area. There were no palpable masses and no tenderness in either lumbar region. Temperature was 99°; pulse 96; respiration 20. White blood count was 13,800, the differential indicated 92% polymorphonuclear leukocytes. The urine analysis showed no positive findings. Further questioning revealed that the patient had suffered constipation for several years and had had a somewhat similar attack of pain two years ago but of a considerably milder character.

The clinical picture was regarded as that of acute appendicitis and immediate operation was advocated under general anesthesia. The abdomen was opened through a right para-median incision. A large inflammatory mass was noted just to the left of the midline, tense, slightly fluctuant and evidently containing fluid.

Further exploration revealed that the mass was retroperitoneal, and as it increased in size had displaced forward surrounding structures. The cyst was dissected free, aspirated, and three liters of an amber fluid removed. The cyst sac was then opened and traced posteriorly as far as possible. Because of the patient's condition extensive exploration was deemed unwise. Therefore, as much of the cyst sac as could be delivered was resected and ligated and the posterior peritoneum closed. A cigarette drain was inserted and the abdominal wall closed in layers.

*Events:* The patient pursued a stormy post-operative course. He complained continually of severe pain in the left lower quadrant. He developed considerable abdominal distention and vomited frequently, then rapidly developed a paralytic ileus from which he expired four days after operation.

*Autopsy:* On opening the abdomen, one could see distended loops of small bowel filled with fluid, the distention beginning at a point  $5\frac{1}{2}$  feet from the cecum. The cecum and appendix were situated high, just posterior to the lower margin of the right lobe of the liver. The appendix was grossly normal. A collapsed cystic sac was present in the left retroperitoneal area. The cyst measured 20x6x6 cm. and extended from the upper calices of the left kidney to the posterior-inferior surface of the bladder. The remaining portion of the cyst measuring 8x6x6 cm. had been removed at operation. The cyst wall was smooth and the external surface contained fatty tissue. The contents of the sac consisted of an amber blood-tinged fluid.

Analysis of the cyst contents revealed the following: Spec. gravity 1010; reaction alkaline; bile negative; sugar negative; albumin ++++; urea 14 Mg.; many R.B.C., occasional W.B.C.; bacteria negative, culture negative, disastase negative.

The left kidney weighed 100 gm. and the capsule stripped easily. A sectioned surface revealed a normal cortico-medullary ratio and the cystic mass apparently



attached to the upper calices. The left ureter was dilated to 3-4 cm. in diameter. The right kidney weighed 190 gm. and had an easily removable capsule. Sectioned surface of this kidney also revealed a normal corticomedullary ratio. The right ureter was 25 cm. in circumference.

The mucosa of the urinary bladder was of a pale pinkish color and no diverticula were found. There was no evidence of an accessory ureter.

When the mass in the left lumbar region was dissected, the cyst was found to extend to the left kidney and to end blindly at one of the upper calices. The left ureter although attached to the cyst wall was easily separated. The calices of the left kidney were slightly dilated as was the renal pelvis.

Microscopic examination revealed the cyst wall to be composed of a fibrous stroma, small vessels and many lymph spaces. A small amount of adipose tissue was also present. No mucosa could be identified and no epithelial cells were noted.

The pathologist's diagnosis was therefore that of a solitary congenital retroperitoneal cyst attached to the left kidney, and probably arising from a calyx in its development from the müllerian duct.

*Comment:* Solitary cysts of the kidney are seldom recognized clinically as such. Hepler in 1930 was able to collect only 249 cases from the entire medical literature. They are commonly classified as serous and hemorrhagic cysts.

*Etiology and Pathogenesis:* It was believed by early writers on the subject that congenital cystic kidney was produced by a mechanical blocking of collecting tubules and subsequent retrodilatation. Recently Hepler has artificially produced such a cyst in a rabbit's kidney by fulgurating a papilla and ligating the artery which supplied the same pyramid. He thus produced obstruction to urinary secretion, in addition to anemia of the secretory tissue obstructed. From this experiment he concluded that the etiology of all serous and hemorrhagic cysts is not the same. He believed that they may be produced as the result of obstruction to the secretion of a group of tubules and interference with the blood supply of these tubules.

*Embryologic Consideration:* Congenital solitary cyst of the kidney is believed to be caused by the failure of union of the two embryonic elements from which the permanent mammalian kidney is formed. The ureteral bud grows into the renal blastema or metanephros and after expanding to form the renal pelvis, gives off the major and minor calices. From the minor calices, through many divisions, are formed the collecting tubules. Ordinarily the collecting

tubules unite with the convoluted and other tubules which develop from the secretory cells of the renal blastema. A failure of these two portions to unite is at present the most generally accepted explanation of the origin of congenital solitary cyst of the kidney.

As a rule, solitary cysts lie just beneath the true capsule of the kidney and extend down to the kidney pelvis from which they are separated by a thin wall. As these cysts increase in size they sometimes create a capsule of compressed kidney tissue around the periphery. The wall of the cyst is densely adherent to the kidney substance and cannot be readily shelled out. The usual site of origin is at either pole of the kidney.

*Symptoms and Diagnosis:* As a rule, no urinary symptoms are noted in this condition. Cysts of the upper pole may produce misleading symptoms from pressure on adjacent structures and are palpable only quite late in their development. Cysts of the lower pole when sufficiently large to produce pressure symptoms are usually palpable.

*Pyelography* may at times show the actual outline of the cyst. A filling defect will be noted if the cyst encroaches on the cavity of the pelvis. Such pyelograms when the cyst cannot be palpated are usually interpreted to be tumors of the kidney parenchyma. A function test made on the affected side may show a diminished output due to extensive kidney destruction resulting from pressure.

*Summary:* 1. A case is reported herein indicating an almost positive picture of acute appendicitis, and eventually found to be a large kidney cyst.

2. One should bear in mind the possibility of the occurrence of congenital abnormalities even in the presence of a fairly clean-cut picture of intra-abdominal pathology.

3. On opening the abdomen, the accidental finding of a large cyst especially in a male, other conditions being ruled out, should lead one to strongly suspect a renal origin even though no signs or laboratory findings indicate kidney pathology.

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## THE TREATMENT OF EMPYEMA COMPLICATING ARTIFICIAL PNEUMOTHORAX

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Next to air embolism, empyema is the most serious complication of artificial pneumothorax. In spite of the most painstaking technique, it develops in a sufficient number of cases to make its treatment an important and ever recurring problem.

In considering the therapy of any disease it is well to bear in mind the objective which one wishes to reach. In every instance this is cure, but cure by the simplest and safest means and with the least permanent impairment of function. The disease which we are discussing tonight is a complication of a treatment of pulmonary tuberculosis and, in this instance therefore, we must consider not only the empyema but the basic tuberculosis. Our object must be to cure the empyema as simply and safely as is possible, but in such a manner as to assure also the healing of the pulmonary disease and in the end to leave the patient with a maximum amount of functioning lung. How one handles the empyema must be determined in each instance by the condition of the lung.

Purulent effusions complicating artificial pneumothorax can be classified under three headings:

1. Tuberculous empyema without secondary infection.
2. Empyema with secondary infection, but without bronchial fistula.
3. Empyema with mixed infection and bronchial fistula.

Tuberculous empyema without secondary infection usually produces few symptoms. It is serious and demands treatment because in a very high percentage of cases bronchial fistula and secondary infection eventually ensue, and because always it leads finally to such thickening of the pleura that reexpansion of the lung becomes impossible.

Confronted with a patient with tuberculous empyema, one must first consider the condition of the underlying lung. If a satisfactory pneumothorax has been maintained for some time and the sputum has been negative, the complication is an indication for permitting the lung to re-expand. Repeated aspiration is all that is required.

If the pneumothorax is satisfactory but has been maintained too short a period to assure healing of the tuberculosis, one must aim to cure the empyema without sacrificing the collapse. This can be done either by aspiration and pleural lavage or by inducing an oleothorax. If the former course is pursued the fluid aspirated must be replaced by air. Oleothorax, I believe, should be reserved for the resistant cases. The pleural thickening which it produces prejudices the chances of reexpansion of the lung.

If the pleura is so thick the lung will not re-expand or if the pneumothorax is unsatisfactory—if a cavity is still open and the sputum still positive—in other words, if the condition of the lung is such as to warrant thoracoplasty, then thoracoplasty is indicated. It will cure both the empyema and the tuberculosis. When thoracoplasty is performed in the presence of pyopneumothorax, the pus and air must be aspirated before and after each stage. Otherwise, the collapse will be compromised and a dangerous positive pressure created in the pleural cavity.

Mixed infection of the pleural cavity is a much more serious complication than simple tuberculous empyema. In this, toxemia is usually marked and failure rapid and progressive. If there is no broncho-pleural fistula one must strive to sterilize the pleural cavity by aspiration and irrigation without resorting to surgical drainage, aspiration every day and lavage of the pleura with azochloramide or gentian violet solution.

If one fails in this, drainage must be instituted, and, regardless of the condition of the lung, every attempt must be made to secure its reexpansion and the obliteration of the empyema cavity. Closed drainage low in the axillary region is the procedure required, closed drainage because it permits the use of suction and favors expansion of the lung, and drainage in the axilla rather than behind so that the thoracoplasty, which will probably be needed, can be performed in a clean field. Usually one need be in no hurry



to proceed with the surgical collapse. Occasionally the empyema cavity can be completely obliterated without it, in which case, if the tuberculosis is arrested, one's problem is very simply solved. In any case, the smaller the empyema cavity when surgery is finally resorted to, the less extensive will the procedure have to be. Obliteration of the whole pleural cavity by resection of ribs is difficult and deforming.

Empyema with mixed infection and broncho-pleural fistula presents the most difficult problem. It is particularly hard if the fistula and infection develop when the lung is not adherent, the pleura not thick, and the mediastinum still mobile. Under these conditions, the lung collapses completely. Closed drainage, suction and irrigations are impossible on account of the fistula and one is confronted with the necessity of establishing open drainage under conditions in which it is particularly contraindicated. I know of no satisfactory way of treating these cases. The problem of getting them into sufficiently good condition to go safely through a very extensive thoracoplasty is frequently insoluble. Closed drainage with frequent small irrigations (small enough so that the fluid will not reach the fistula) or open valvular drainage may be used. In spite of everything, the temperature frequently remains high and the patient goes steadily and rapidly downhill.

Empyema with fistula is a less serious matter if extensive adhesions have prevented a complete pneumothorax and the pocket is localized and fairly rigid. Open drainage is then definitely indicated. This is usually followed by a prompt fall in temperature and a gradual reduction in the size of the cavity. The fistula occasionally closes spontaneously. The patient's condition is usually so good that thoracoplasty can be postponed until the cavity has ceased contracting. This may require a year or eighteen months. The time, however, is well spent, for the smaller the cavity becomes, the smaller the operation which will be required.

If the residual empyema cavity is small it may be closed by a local Schede operation. In all other instances, a typical posterior extrapleural thoracoplasty is required with axillary stages to permit complete removal of all the ribs. At the final axillary stage it is usually necessary to carry the incision into the drainage wound and perform a more or less extensive Schede opera-

tion with resection of the chest wall over the remaining cavity. This is the most deforming and incapacitating part of the operation. It necessitates section of the intercostal nerves, which produces a bothersome paralysis of the abdominal muscles, and it leaves a portion of the chest wall unprotected by ribs. Paradoxical respiration over the area may seriously reduce the vital capacity. In several recent cases I have been able to obviate this stage by reestablishing closed drainage and suction. After the chest wall has been collapsed by thoracoplasty the lung can frequently be drawn into opposition with it and the cavity thus obliterated.

#### SUMMARY

1. Purulent effusions complicating artificial pneumothorax can be classified under the following three headings:

- a. Tuberculous empyema without secondary infection.

- b. Tuberculous empyema with secondary infection but without broncho-pleural fistula.

- c. Tuberculous empyema with secondary infection and broncho-pleural fistula.

2. Treatment of those conditions must aim to cure the empyema as simply and safely as is possible, but in such a manner as to assure also the healing of the original tuberculosis.

3. If the pneumothorax has been satisfactory and has been maintained for a year or more, re-expansion of the lung should be encouraged.

4. In simple tuberculous empyema repeated aspiration will frequently accomplish this.

5. In empyema with mixed infection but without broncho-pleural fistula, daily lavage with azochloramide or gentian violet solution will frequently sterilize the cavity.

6. If the pneumothorax is satisfactory but of two short duration, it should either be continued after sterilization of the cavity or oleothorax should be induced.

7. If the pneumothorax has not been satisfactory, sterilization of the cavity should be followed by thoracoplasty.

8. In mixed infections with broncho-pleural fistula, drainage and thoracoplasty are usually indicated. They should be delayed as long as the temperature can be controlled by aspiration and lavage in the hope that the fistula will close and the cavity become smaller and more rigid.

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## VISCERAL PAIN

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Perhaps the only excuse that I might offer for attempting to present this subject, is that as a general practitioner for almost thirty years, I have been greatly interested, not only in the acute pains of visceral origin, but also in the extremely variable, often indefinite, poorly defined pains complained of by my patients. We all again and again have been puzzled when our most earnest endeavor fails to present a cause, and yet our patient continues to complain. Perhaps at times we are justified in doubting the patient's interpretation of pain, particularly as to its severity, but as a rule they try to be honest with themselves and with us as well. Is the greater fault not ours?

The question of visceral pain has been discussed pro and con for many years. Some authorities formerly claimed there was no true visceral pain. However, to the little boy who ate too many green apples, it matters little what you call it, he knows he has pain and that is the important thing in our patient's concept. I claim no originality in submitting this sketch as I have drawn heavily from the works of Lange, Ross, Mackenzie, John Morley, Capps, Zachary Cope, Davis and Pollock. I am not a neurologist and therefore could not, if I would, overwhelm you with technically correct, experimentally compiled detail. As a colleague I am however willing to confess that many a time I have pondered over acute and chronic cases and then asked myself "Is there something about this visceral business that I should but do not know? Am I failing to read what to others is clearly legible?"

May we not think of pain as an extremely variable interpretation, depending not only on the individual but his physical, nervous and mental state at the time of the application of the stimulus which registers the sensation which he calls pain? That some individuals are hyposensitive and others hypersensitive is uniformly admitted. Is pain primarily a defensive mechanism? If so, then environmental adaptation would dictate that the parts of the body should respond to the stimuli which they encounter. The somatic tissues or that portion of the body di-

rectly connected with the central nervous system, we know is sensitive to stimuli produced by a cut, pinch, heat, chemical, electrical and mechanical irritation. The viscera, however, are protected from these irritants, they are within the abdominal and chest cavities, shielded by walls which do react to these danger signals. Why should the viscera be sensitive to stimuli which they normally do not receive? Furthermore, may the viscera not respond to stimuli which serve a useful purpose to them? The two stage colostomy caused Lemander to believe the abdominal viscera are entirely devoid of sensory nerves capable of producing pain and that all painful sensation from disease of intraperitoneal organs originate in the parietal peritoneum, and its sub-serosal layer, which is richly supplied with cerebrospinal sensory nerves.

Ross thought there are two kinds of pain in disease of internal organs:

1. A true splanchnic pain which is felt in the organ.
2. An associated somatic pain which is felt in that part of the body wall which has cerebrospinal nerves connected with the same segments of the cord.

Mackenzie thought there was no splanchnic pain, believing it a referred pain. He developed the "viscero-sensory" and "viscero-motor" reflex idea from observing a hyperalgesia of the skin and muscular contraction due to disease of abdominal viscera.

Head followed Ross' idea of a low form of protopathic or visceral pain but thought the main manifestation was a referred pain. He outlined skin segments, from his studies of herpes zoster, to which pain is referred in visceral involvement.

Hurst now came along and showed that the viscera are sensitive to their accustomed or appropriate stimuli, not cutting, pinching, burning, etc.; but to increased tension on their muscular wall. Pollock and Davis state "It is now known that visceral afferent impulses may appear in consciousness as a painful sensation and that at least in the stomach or intestine, there is also a crude form of temperature sensibility."

Morley in "Abdominal Pain" is convinced of a true visceral pain, the result of tension on the walls of hollow viscera. This pain is not referred to the superficial portion of the abdominal wall and is described as a deep seated central pain,



not accurately localized. Further, he states that deep or superficial tenderness, as well as muscular rigidity of the abdominal wall noted in inflammatory disease in the abdomen, are referred from sensitive somatic or cerebrospinal nerves to parietal peritoneum.

Lemaire's work followed by that of Weiss and Davis showed that infiltration of the proper skin area with local anesthetic in cases of various diseases such as inflammatory diseases of the abdomen; acute appendicitis, salpingitis, pyelitis and cholecystitis, or even gastric ulcer and kidney stones or in chest conditions as carcinoma of the esophagus, pleuritis or angina pectoris, was followed "with either complete relief from the pain or relief to a large extent."

The route travelled by these impulses originating in the viscera are of great interest to the neurologist and physiologist, but the majority of us are content to let them work out the details and give us the benefit of the clinical application. The many theories show how complicated these paths must be and how indirect some of these routes really are.

Capps and Coleman clearly showed the interpretation of the shoulder tip or trapezius ridge pain. They showed that the parietal pleura and about one to two inches of the margin of the diaphragm are very sensitive to stimuli and can be definitely localized by the patient, but that stimulation of the central portion of the diaphragm, both pleural and peritoneal surface, produce pain in an area of skin supplied mainly by the fourth cervical nerve of the same side.

May I cite a case which recently came under my observation. A very intelligent patient complained of pain, sharp-cutting especially on deep inspiration, along the lower border of the right chest, most marked in the right axillary line. This side of the chest was partially immobilized by strapping. The next day the patient stated "The pain in my side is gone but I have a severe annoying pain here over my right shoulder," placing her hand along the ridge of the trapezius muscle. Within 24-48 hours, fluid developed in the right pleural cavity and the shoulder pain disappeared. Some time later as the fluid was absorbed, this pain reappeared for several days, the patient stating "You informed me I was improving but I again am having the same pain in the shoulder and neck." This referred pain as Capps demonstrated, travels along the phrenic

nerve; then, as recently shown by Pollock and Davis, by the following complicated pathway. "Entering the cord by way of the posterior roots, it descends to the level of the eighth cervical and first, second and third thoracic segments; then a connection is made with cells in the intermediolateral column and sympathetic efferent impulses travel over the preganglionic fibers through the anterior roots to the cervical sympathetic ganglia. From here postganglionic fibers travel to the skin, blood vessels, meninges, etc."

In connection with a severe stimulation of the pleural surfaces, on the right side near the lower portion of the pleural cavity, there may be a "spilling" of impulses, so that the spinal nerves supplying the anterior abdominal wall on the right side cause a reflex rigidity and a referred pain to this overlying skin area. This condition has been diagnosed many times as acute appendicitis.

Remembering that embryologically the diaphragm has been displaced downward, it gives us perhaps the most striking example of referred pain. Other routes exist in connection with abdominal viscera but their clinical manifestations are to us more important.

The hollow viscera are ordinarily not subjected to such external stimuli as being cut, pinched or burned, but they are commonly subjected to an adequate stimulus in the distention or stretching of their walls and according to Hurst, produce their own true visceral pain.

*Perforated Gastric and Duodenal Ulcer:* When a gastric or duodenal ulcer perforates, the sudden, generally severe, agonizing abdominal pain is caused by the escaped acid gastric contents, with reflex board-like rigidity of the abdominal muscles and marked tenderness to pressure; the resulting pain is due to acid irritation of the exquisitely sensitive somatic nerves of the parietal peritoneum. This is not a visceral pain but Morley claims that "pain is also referred in the greater number of cases to one or both shoulder tip areas." This occurs if the escaped irritating fluid comes in contact with the sensitive inferior surface of the diaphragm, especially if the patient is or has been in the recumbent position. The trapezius pain generally is first noted on the right side, later perhaps both sides. The somatic pain from the parietal peritoneum overshadows the shoulder tip pain and the pa-

tient will not complain as a rule of their phenomenon unless asked by the physician. If spinal anesthesia is induced, blocking the abdominal pain, the patient then as a rule, will complain of the shoulder tip pain.

If the spilled gastric fluid has reached the lower abdomen and irritated the peritoneum, the differentiation from acute appendicitis might be aided in determining the presence or absence of this trapezius pain. Its presence should help exclude appendicitis.

Intraperitoneal hemorrhage, whether from ruptured liver, spleen or ruptured ectopic pregnancy, if of sufficient quantity so that some of the blood reaches the lower surface of the diaphragm; very much aided by the prone position will produce sufficient irritation to cause this fourth cervical nerve pain. The clotting of blood produces some irritant capable of stimulating the peritoneum, both parietal and diaphragmatic. Morley cites a case of ruptured spleen, with the usual hemorrhage, where the patient's only complaint was "pain and tenderness in the tip of the left shoulder, intensified with each respiration."

Pain in the stomach or duodenum may be due to distention or increased tension on the endings of the afferent autonomic nerves in its muscular coat. Visceral pain of the stomach is centrally situated in the epigastrium and is only vaguely localized, often described as "gnawing, aching, boring pain" but never as sharp or stabbing. As a rule this pain is a continuous pain though it may be intermittent or spasmodic. True visceral pain is not associated with localized tenderness on pressure or with muscular rigidity.

Palmer believes that the acid gastric juice contains a normal irritant to the pain producing mechanism. Others think contractions, some think deformations of the nerve endings in the wall of the viscus, especially where some fibrosis is present, cause this pain. Others think that pain impulses from the stomach are transmitted by splanchnic nerves and there is some ground for the belief that the vagi are "undoubtedly both afferent and efferent, transmitting centrifugal and centripetal impulses and are concerned with the motor, vasomotor, secretory and sensory functions of the organ."

Morley writes "Until our knowledge becomes more precise, it must be confessed that we do not know whether tension on nerves in the muscular

coat, hydrochloric acid or vascular congestion or even some combination of them, affords the true stimulus for the production of pain in gastric or duodenal ulcer."

Among the chief objective signs, the following may be enumerated:

1. Cutaneous hyperalgesia, produced by lightly pinching up of folds of skin. However, this is also often found in abdominal neuroses.

2. Deep tenderness in the epigastrium, especially during an attack of spontaneous pain. The tender point corresponds closely with the local lesion in the stomach or the duodenal wall, shifting in position with the ulcer. Morley thinks this "deep tenderness" is due to the sensitive parietal peritoneum, stating "when the sensitive parietal peritoneum is pressed down by the examining finger, into closer contact with the ulcer, it receives a painful stimulus." If the tender point is to the left of the mid-line, the ulcer is more likely gastric; where the tender point is to the right, more usually the source is duodenal; both may be under the mid-line if the patient lies in supine position.

3. The muscular rigidity generally associated with rather marked deep tenderness is of the true involuntary type, perhaps produced by inflammatory reaction in the ulcer area.

In cancer of the stomach the pain produced depends upon the position of the cancer.

1. If in the body of the stomach the pain is not marked until late, when the pain may be severe, due to infiltration of the parietal peritoneum or to metastases in other parts of the peritoneal cavity.

2. In cancer of or near the pylorus, pain largely depends upon the degree of obstruction, the severe pains being the result of violent peristalsis.

3. If the carcinoma is situated in the cardiac orifice, stenosis with dysphagia and substernal pain result. Again carcinoma may be of the ulcer simulating type. Palmer states "Clinically: 1. Carcinoma of the stomach may produce pain similar to that of ulcer and be relieved by the same factors; 2. there may be immediate pain with food." He further found that pain in carcinoma of the stomach may be quite unaccompanied by any change in intragastric tension or motility while in other cases pain synchronized with gastric contractions and was relieved by emptying the stomach. He gives



three factors causing pain in carcinoma of the stomach: "Acid irritation, muscle tension and probably infiltration of nerve fibers. The exact mechanism of pain production by acid is no better understood in malignancy than in benign ulceration."

In *Gallstones*, pain radiating to the lower angle of the right scapula is quite the rule, but in about 5% of the cases, there likewise is found a true shoulder tip pain, supplied by the fourth cervical nerve along the trapezius ridge, probably due to stimulation of phrenic fibers below the diaphragm. In considering pain produced by gallstones, it is convenient to consider the positions of the stones at the time of production of the symptoms: 1. Stones in the gall-bladder without obstruction may elicit no symptoms whatsoever or again the patient may suffer from vague attacks of pain in the epigastrium, perhaps definitely related to meals. There may be a visceral pain in the center of the epigastrium or a tenderness on palpation over the gall-bladder. A spontaneous pain in the right hypochondrium is thought by some to be due to reflex pyloric spasm. 2. Biliary colic: the early pain may be described as central epigastric and is of a boring or heavy character. Early there is no tenderness to palpation. The pain then spreads over the right hypochondrium and radiates through to the back, near the angle of the right scapula. Now tenderness to pressure and muscular rigidity are present. The mechanism of biliary colic may be compared to that of intestinal colic. The bile duct; a fibro-muscular tube accustomed to the passage of liquid, now is distended with a hard foreign body, often requiring considerable stretching of the wall, resulting in violent peristaltic waves. According to Morley the pain is due to tension on the afferent autonomic nerves by the excessive contractions of the muscular fibers in the wall of the duct. It is vaguely localized as is the rule with splanchnic pain and its central position in the epigastrium is explained by the embryological fact that the bile ducts with the gall-bladder and liver are developed as an outgrowth of the intestinal tract at the junction of the primitive foregut and midgut. The pain that develops later over the gall-bladder and radiates through to the angle of the scapula appears to be a somatic pain, and is associated with definite tenderness and rigidity in the right hypochondrium.

This pain is thought to be due to inflammatory changes, following the temporary obstruction of the duct, and is sufficient to stimulate adjacent cerebral spinal sensory fibers of the parietal peritoneum. The inflammation of the ducts themselves stimulates the somatic nerves of the posterior parietal peritoneum around them and so gives rise to the pain in the angle of the right scapula. The inflammation of the fundus of the gall-bladder stimulates the anterior parietal peritoneum in contact with it and so causes the pain in the hypochondrium with the associated localized tenderness and muscular rigidity. 3. Acute obstructive cholecystitis is ushered in by a severe pain in the center of the epigastrium and after a few hours, pain in the right hypochondrium, with extreme tenderness over the fundus of the gall-bladder, with a high degree of local muscular rigidity, often preventing palpation of the fundus of the distended gall-bladder. Maximum tenderness and rigidity will always be found over the fundus of the distended gall-bladder where it is in contact with parietal peritoneum. The muscular rigidity is a true defensive reflex; the deep tenderness is due to a radiation from the sensory nerves. Mackenzie states, however, "No conclusion should be drawn as to the sensitiveness of an organ which has been stimulated through a structure itself sensitive."

Pollock and Davis have recently shown that if all possible nerve routes are severed, except splanchnic, pain will still be registered on distention of the gall-bladder.

*The Mechanism of Pain in Acute Appendicitis.* Appendicitis is the commonest of all the acute abdominal disorders that often call for prompt surgical care. As a rule there are two distinct pains in a typical attack of acute appendicitis. These two pains differ profoundly in subjective quality, in their associated physical signs and in their mode of production.

*The Initial Pain.* On careful inquiry, patients with typical acute attack of appendicitis give a definite statement of the first pain starting in the center of the abdomen, a little above the umbilicus. This pain is not intense at first, but increases rapidly in severity, and may be wave-like or spasmodic in character, often becoming quite severe. This pain is not felt on the surface of the body but is deeply situated and but vaguely localized in the center of the abdomen. During this early stage, palpation

does not reveal a definite tenderness or muscular rigidity, neither in the central area where the pain is felt, nor in the right lower quadrant. The absence of definite objective physical signs as shown by a soft, and to palpation, normal abdomen, can cause the most careful clinician to miss the diagnosis in this stage.

The inflammatory changes during the early hours of an attack are limited to the interior of the appendix. Morley states: "I believe the initial pain in appendicitis is a true visceral pain, originating in the appendix itself and that it has a very definite protective function. It is excited by vigorous peristaltic efforts on the part of the muscular wall of the appendix and like most visceral pain, is due to increased tension on the muscular wall of the organ concerned. Some degree of obstruction to the lumen of the appendix, with retention of inflammatory exudate, distal to that obstruction, is essential to its production." This condition has been described as acute appendicular obstruction and the central visceral pain is continuous until the pressure is relieved. Wangenstein has shown by definite measurements that the intra-appendiceal pressure is greatly increased and believes it a big factor in the production of perforations. Follow-in a perforation, the adequate stimulus, namely pressure on its muscular walls, is removed and the central or visceral pain disappears. In less fulminating cases, as well as with fecal concretions, a kinking at the base, a stricture perhaps the result of ulceration in previous attacks, or a foreign body; all continued with inflammatory swelling of the mucosa, obstruct the outlet through the cecum. Mackenzie remarks: "It is a matter of observation that when nonstriated muscle is stimulated to strong contraction, violent pains result, as in biliary and renal colic or when the bowel contracts behind an obstruction. The contents of the appendix may stimulate its muscular coats to contract and if the contents be not voided in consequence of the stenosis, violent spasm of the muscular wall ensues and severe pain may arise. The reference of the pain to the mid-line would be in accordance with the experience that excessive peristalsis of any portion of the digestive tube, causes pain in the middle line, and parts that have developed from the tube as the gallducts and appendix, follow the same law." The appendix is developed from the primitive mid-

gut loop and therefore the visceral pain should be referred to the mid-line. That the level of the pain is much higher than the position of the appendix, may be checked by the observations, that if the lower part of the ileum is strangulated in a femoral hernia, the violent spasms of visceral pain are felt in the mid-line, at or above the umbilicus. Pains emanating from the large bowel are felt between the symphysis pubis and the umbilicus. The appendix derives its splanchnic innervation from approximately the same spinal segments as the lower ileum.

*The Second or Localized Pain* in acute appendicitis is a true somatic pain. Perhaps this is the part given too much consideration, compared with the early visceral pain. After a longer or shorter period of the central pain, often in a few hours, the second pain usually appears. The second or localized pain may overshadow the first pain and the patient may forget the first, through the intensity of the second, unless reminded of the onset. The second pain differs from the first in that it is limited to the appendiceal area, is sharper and is aggravated by movements, and local tenderness and rigidity develop.

*Intestinal Pain.* In considering intestinal conditions, let us remember that the viscera themselves are probably not supplied by somatic nerves but that the parietal peritoneum and mesentery, up to about one inch from the gut, are richly supplied with sensory nerves, especially the anterior and lateral walls; the posterior perhaps to a lesser extent. Strangulation of a portion of ileum in the sac of a femoral or inguinal hernia, at first, does not give rise to pain in the region of the hernia. The pain is felt as a rule in the mid-line, a little above the umbilicus, corresponding to the first pain in appendicitis. This pain may come in spasms, lasting generally less than half a minute, coming and going with the peristaltic waves. Should some of the mesentery of the bowel be included in the strangulated portion, a continuous pain may remain as a heavy dull ache, which again is overshadowed by peristaltic cramp. In a severe form of bowel and mesenteric strangulation, as by a peritoneal band or a volvulus, the continuous pain from the first may overshadow the cramp. In strangulation of a small knuckle, with the mesentery not involved, there may be no pain between peristaltic waves. This visceral



pain is not accurately localized, but the pain is referred to the region of the mid-line, irrespective of the position of the strangulation, either on the right or left side. In strangulation of the upper portion of the small intestine, the pain is higher, approximately midway between the umbilicus and the tip of the ensiform. In strangulation of the lower portion of the small gut, the pain is above and perhaps including the umbilicus; but the site of this pain is not tender to palpation. Strangulation of the colon will show the location of pain between the umbilicus and symphysis pubis. It is only after a period of time which varies with the severity of the strangulation that the hernial sac becomes tender on palpation, then distinctly painful, increasing with the length of time it is unrelieved. The fixed central pain between the spasms is probably due, when present, to pressure on the somatic sensory fibers in the base of the mesentery. Local pain and tenderness over the hernial sac are due to irritation by a toxic transudate of the parietal peritoneum, forming the sac; unfortunately, this is often a late sign. The first pain is due to pressure or stretching of the visceral wall; the localized hernial pain is somatic, due to irritation as a result of inflammation. This pressure condition is further verified by Wangenstein's treatment of "deflation" in the properly selected and observed cases of intestinal obstruction, without strangulation.

In omental hernia, no bowel is obstructed, therefore no pressure on muscular visceral wall is found, consequently no central abdominal pain is felt. Local hernial pain again is due to irritation of parietal peritoneum.

*The Colon:* As stated before, the visceral pain of the large gut is vaguely localized in the center of the hypogastrium, about midway between the umbilicus and symphysis pubis. Obstruction of the free portion of the large gut, as the transverse and sigmoid, alone will show this early pain. However where the colon is fixed as in the ascending or descending; the patient may localize the point of the obstruction due to a dragging or pressure on the parietal peritoneum.

Pain due to *Peritoneal Adhesions:* Morley thinks peritoneal adhesions do not produce pain unless they cause some degree of mechanical ob-

struction to the intestine. "The most dangerous form of adhesion is the narrow band-like whipcord, a few inches in length which is apt to snare a loop of bowel and give rise to acute intestinal obstruction. I can find no evidence from my own experience for the behalf that adhesions cause pain by dragging on the parietal peritoneum of the anterior abdominal wall. The unobstructed bowel, when adherent to the parietal peritoneum seems to be incapable of producing a drag upon it that is adequate to excite pain."

The pain of *Pelvic Adhesions* is probably due to "irritation of the posterior parietal peritoneum and the sensory somatic nerves in the base of the broad ligaments, by the inflamed tubes in contact with them."

*Post-Operative* or so-called "gas pains" are probably primarily due to the splanchnic, inhibitory reflex caused by the cutting of the parietal peritoneum, handling of the viscera and the closure by suture of the sensitive peritoneum. This splanchnic inhibition is primarily defensive, to limit, localize or help wall off infections. Some fermentation will frequently take place in a loop or loops of the bowel, causing pressure or stretching on the walls of these segments; peristalsis from higher up respond to help relieve this pressure and a "cramp" or "gas pain" results.

#### CONCLUSIONS

Today authorities seem to admit there is a true visceral pain, which is not as definitely localized as somatic pain. The adequate stimulus to produce this pain is not cutting, pinching, burning but pressure on the muscular walls.

*My Closing Plea:* Take time to get a careful history of the onset of abdominal and chest diseases. First get the patient's statements, then present leading questions and evaluate both reports.

A plea is hereby made for the chronic case, complaining of vague pains or discomfort. May not that chronic complainer of indefinite, subjective symptoms be trying to tell us about something that we as yet do not properly appreciate and understand?

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## SOME POINTS IN GYNECOLOGICAL DIAGNOSIS HELPFUL TO THE PRACTITIONER

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The subject that has been selected for me to discuss in thirty minutes, namely, "Some Points in Gynecological Diagnosis Helpful to the Practitioner," might well occupy the time of the entire session here; however, I hope to stress some of the highlights. Because of the limitation of time and the great variety of pathological conditions that may manifest themselves in the female genitalia, only several phases of diagnostic interest will be considered.

Accurate diagnosis in gynecological practice is paramount because by virtue of it, womankind is helped and unnecessary operative procedures are avoided. In diseases of the ear, nose and throat and the eye, diagnosis is made by inspection, for the most part. In many urological conditions, diagnoses are arrived at by the sense of vision aided by well controlled tests of function of the organs. In diseases of the abdominal viscera, there are often many difficulties in diagnosis, but the use of the x-ray with its associated tests has been of great advantage. However, in the field of gynecology, the diagnosis is arrived at by a series of procedures; first, a detailed history and then the physical examination, primarily by palpation, giving only a small part of the desired information necessary to arrive at an accurate diagnosis. The history of the patient, particularly that relating to the menstrual cycle, is important as is a fundamental knowledge of the physiology of the generative organs and an acquaintance with the pathological changes that these organs and the tissues may undergo. Properly directed laboratory examinations are, to be sure, of great importance.

A prelude to the question of gynecological diagnosis is adequately taken up in the following words from C. Jeff Miller's Introduction to Gynecology:<sup>1</sup>

"The danger inherent in all specialization is that the general consideration of the patient will be forgotten in the consideration of the local disease. This is a particularly likely pitfall in gynecology, in

which the local pathology is often so clear-cut that it is easy to overlook the fact that very frequently there are also associated with it remote lesions or constitutional disease. For this reason the study of every gynecologic patient should begin from the point of view of the general practitioner; the gynecologist can remember his specialty later, and his local investigation will often be simplified and clarified by his preliminary general survey.

"Another danger inherent in every branch of modern medicine is the paradoxical one that the patient may be studied too intensively. Laboratory methods have been multiplied and refined, hospitalization is resorted to for the simplest and most obvious complaints, and the young practitioner, fresh from his university and interne training, is all too likely to believe that no other methods of study and treatments are possible. This is entirely incorrect. Ninety per cent. of the patients one sees do not need an elaborate routine, and can be investigated adequately and treated satisfactorily in the office and in the home. There is not the smallest excuse for extensive and expensive laboratory studies which are not directed to a definite end. The patient's symptoms and physical findings alone should mark out the lines for special investigation, and the physician whose conscience and whose sense of personal responsibility are properly developed will not be guilty of misplaced zeal in this direction.

"The principal pathologic conditions which the gynecologist has to consider include inflammatory and infectious diseases, new growths, obstetric sequelæ and physiologic dysfunctions. The principal symptoms which he has to consider include abnormal secretions, bleeding and pain, and in the making of a diagnosis they must be evaluated quite as carefully as the physical findings which he is able to demonstrate and infer.

"The internal genitalia of women are for the most part inaccessible and lesions in them must be determined as much by inference and reasoning as by actual demonstration. The problem of the gynecologist is not an easy one, for he cannot see a large majority of the diseased conditions he is seeking to elucidate, and he must detect them with the abdominal and vaginal walls intervening between his fingers and the organs he is trying to palpate. For that reason he must know the normal or he will not recognize the abnormal, and he must train his fingers rather than his eyes. It is essential that he develop and educate his tactile sense, for the most ingenious instruments devised cannot take its place."

There will be no attempt made to go into the question of developmental abnormalities, gonorrhea and syphilis with all its manifestations, non-specific infections, injuries and inflammations following obstetric trauma, misplacement of the uterus and appendages, benign tumors of

<sup>1</sup>Read before Southern Illinois Medical Association, November 12, 1936.

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the uterus and ovaries including endometriosis and a complete review of functional disorders.

The role of various pregnancy tests, the significance of symptoms and signs in relation to malignancy, the value of the Schiller test, biopsy and curettage in arriving at a diagnosis, and the examination of vagina and cervix in relation to non-hemorrhagic discharges will be dealt with at some length.

*Pregnancy tests:* It has been shown by numerous investigators that the hormone of the anterior lobe of the hypophysis is present in high concentration in both the blood and urine of pregnant women; this hormone stimulates the ovary and causes the gonads to mature.

1. The Aschheim-Zondek<sup>2</sup> test for pregnancy is based on the presence of the anterior pituitary hormone in the urine. The technic of the test as recommended by them was to use five infantile mice, injected subcutaneously with urine two or three times a day in an interval of forty-eight hours. The mice were autopsied at one hundred hours after injections were started. They preferred to use a morning specimen of urine, obtained either by catheterization or voiding. They recommended the procedure as a diagnostic test for pregnancy, because it was relatively simple and readings were obtained macroscopically.

2. The Friedman<sup>3</sup> test involves the intravenous injection of urine into the rabbit. Five c.c. of voided urine is given intravenously and autopsy performed after twenty-four hours.

3. Modification of Aschheim-Zondek test (T. K. Brown<sup>4</sup>), 2 c.c. to 5 c.c. of serum were injected intravenously into the ear vein of a virgin female rabbit. Approximately 10 c.c. of whole blood are obtained from the patient and the serum is removed. The serum is allowed to stand for at least four hours or over night before injection, as very fresh serum was found to be toxic and might cause death shortly after injection. The average effective amount of serum was found to be 1 c.c. per 600 to 700 gm. of body weight.

The rabbits were operated upon or autopsied from twenty-four to thirty-six hours after injection and the reaction could usually be determined by gross examination. Microscopic examination was used to check the gross findings. The rabbit could be used again at the end of three weeks.

The earliest grossly positive reaction was observed at thirteen hours. The period of gesta-

tion, in a repeated series, varied from three weeks to seven months.

The reaction to the use of serum intravenously is found to be definitely more marked and to appear in a shorter time than when urine is used intravenously.

This reaction may be observed more definitely in the gross than is the case in the original Aschheim-Zondek "pregnancy test" and in one-fourth to one-third of the usual time.

The types<sup>5</sup> of reaction found in the ovaries of the experimental animals were:

1. Maturation of the Graafian follicles.
2. Marked hyperemia and hemorrhage into the enlarged follicles which could be observed with the naked eye.
3. The formation of corpora lutea.
4. The formation of corpora lutea with imprisoned ova.

These tests are accurate in 98% of cases and may be positive as early as 30 days after the last menstruation.

It is the stimulation by fetal ectoderm of the imbedded embryo that produces so-called prolan, the hormone originating in the hypophysis. The degree of response in its production depends upon the amount of chorionic tissue in intimate contact with the maternal tissues and for that reason is not positive in very early gestation and may remain positive after delivery or fetal death. The prolan content is greatly increased in cases of proliferation of the fetal trophoblast such as hydatidiform mole or chorioepithelioma. The tests are positive in pregnancy, abortion, hydatidiform mole, chorioepithelioma and ectopic gestation. The value of the test is readily seen in cases where myomata are present in the uterus or ovarian cysts exist which may obscure the pregnancy. In cases of threatened abortion, continuing over some period of time, information can be obtained as to the status of the pregnancy and the effects of the blood loss up to that time. In the difficult question of differentiation in early pregnancy between abortion, threatened abortion or missed abortion, a logical course can be mapped out by a knowledge of the pregnancy test. In the early abortion, the test may remain positive for a few days after discharge of the fetal sac; in the threatened abortion it is positive, but if later we find that the uterus does not enlarge, remains stationary in size or actually decreases in size in

the presence of a negative pregnancy test, we are justified in emptying the uterus for a missed abortion. Without the test under those circumstances, only prolonged observation with careful estimation of the size of the uterus would give us the desired information as to the survival and continued growth of the embryo.

The persistence of a positive reaction after hydatidiform mole suggests the continued presence of fetal elements in the maternal organism and may give us a valuable clue in the diagnosis of chorioepithelioma.

*Carcinoma of the Cervix.* Graves<sup>6</sup> has long been a consistent and earnest advocate of the theory of trauma as the most important predisposing cause of cervical malignancy, and the figures from his clinic, which are striking enough to be quoted in detail, seem to prove his point conclusively.

"In 669 cases of cervical carcinoma, only twelve patients, less than 2% had had previous obstetric repairs; in two of these cases cancer had existed in the first operation and was overlooked until the tissues were re-examined in the course of this study; in one case symptoms ensued almost immediately after operation, and the disease was probably preexistent; in most of the other nine cases pathologic records were lacking, and it was assumed that perhaps similar findings might have been revealed. Graves also studied nearly 6,000 women in whom cervical injuries had been corrected, and found that only seven of them later developed cancer; in three instances (including the two mentioned in the first group), the disease was overlooked at the first operation and in two others the operation was improperly done, leaving only two cases to be explained on other grounds.

"There is nothing pathognomonic in the symptoms of carcinoma of the cervix; the disease in its early stages doesn't interfere with any important body function, and its onset is therefore always insidious. For that reason any unusual or untoward symptoms related to the genital tract demand prompt investigation at any period of life, and particularly during middle life.

"The cardinal triad of symptoms are in the order named leucorrhea, bleeding and pain, but pain is always a late symptom and leucorrhea is inclined to be overlooked until the more conspicuous symptom of bleeding occurs. The leucorrheal discharge at first differs from the normal cervical secretion only in quantity, not in quality, because at first it is due merely to hyperemia and to secretion from the new cells. The watery consistency is at all stages the most typical thing about it. At the onset it is usually colorless, though it may be yellowish or brownish; later it becomes mixed with blood plasma, as the walls of the blood vessels become more per-

meable, and in the final stages of ulceration and necrosis it is always very foul and purulent, the characteristic odor being due to putrefactive bacteria, which gain a ready entrance through the breaks in the surface of the friable growth with its immature cell structure. At the onset, it is acrid, irritating and even excoriating, and is often associated with a pruritus of the vulva or a dermatitis of some sort. In the final stages cervical stenosis may cause a pyometra.

"The typical bleeding of carcinoma is metrorrhagic in character, never menorrhagic, unless disease which would cause that type of bleeding is present also. Bleeding will promptly follow the slightest trauma, and always follows coitus, douching, examination and instrumentation. Blood is lost in increasing amount as the disease progresses, but since it is always of venous origin, fatal hemorrhages are rare unless some large vessel is eroded.

"Pain never occurs until ulceration and infection have set in and the parametrium and lymph nodes have been invaded. Its presence therefore, practically always means that the stage of curability has passed. Its delayed appearance is because of the fact that the cervix, the point of origin of the disease, is a peculiarly insensitive organ. It is of a dull, aching, boring character, and it tends to be worse at night. In the late stages it may be excruciating. It is most frequent in the back, the thighs and the pelvis, and unilateral pain in the lower back near the ischiatic region is often the first sign of a recurrent malignancy (Graves).

"In the clinical diagnosis of advanced carcinoma of the cervix there is probably less than 1% of error, for the veriest tyro can recognize the disease on inspection. But at such a stage treatment is of little avail, and that picture of malignancy should be discarded and in its place should be substituted the picture of the early case, which can be recognized only by the microscope, and sometimes with difficulty then. The public campaign of education is bringing to the gynecologist and the general practitioner each year increasingly large numbers of women with early lesions, in whom every circumstance is favorable for a cure, and the onus of the recognition of the disease is thus placed directly on the medical profession. The concept of cancer with a cauliflower excrescence is quite as erroneous as is the concept of appendicitis with peritonitis (Novak). In both cases there has been fatal delay. The clinical picture and the gross pathology, once so important in diagnosis, are now recognized as less and less essential (Bloodgood), and all of the emphasis is rightfully being placed on the early microscopic picture which is radically different from the late picture and from the conception of the disease which even trained pathologists are prone to entertain.

"To consider the clinical aspect of the diagnosis first, a story of leucorrhea, with or without bleeding, in a woman near the menopause, should always arouse



one's suspicions and should lead to a searching local study, accompanied by an equally exhaustive microscopic study.

"Examination should be done digitally, bimanually, rectally, by speculum, and, if indicated, by cystoscope. In the typical case the vulvar area will show on inspection some irritation and excoriation from the discharge, while the cervix frequently exhibits a cervicitis. Inspection through the speculum and digital examination will reveal in the very early case a small, hardened, unilateral, granular area, which even at this stage may be covered with fine, sprout-like growths, and which is prone to bleed on the slightest touch. The malignant area will be more diffuse, if it has developed in an old erosion or a cervical ectropion. Another case may exhibit a shallow ulcer with slightly elevated edges, while a third may exhibit an inconspicuous nodule, indurated, congested, bluish and mottled. The vaginal cervix may be puckered or retracted, and the whole organ may have a glazed appearance. If the growth is more extensive, the cervix loses its normal resilience and has a typical hard, inelastic and board-like feel. If ulceration is present, the color varies from yellow to greenish-black, and the ulcer borders are jagged and irregular. In the more extensive nodular type the cervical mucosa, though still intact, presents in circumscribed areas small, boss-like irregularities or possibly small papillary projections. The various findings become more and more pronounced as the disease advances, the evert-ing type finally exhibiting characteristic cauliflower masses, while in the inverting type the entire interior of the cervix may be converted into an ulcerating crater.

"The vagina should be inspected and palpated for any evidence of superficial or deep nodules, and the other pelvic structures should likewise be examined for possible extensions. Rectal examination gives by far the best conception of lateral and posterior extensions, which often cannot be detected by the ordinary bimanual method. When the broad ligaments are involved, or when puckering, edema or induration of the bladder base is evident, cystoscopic examination is indicated. It should be omitted, however, if the urethra is in any way involved in the malignant process, for rupture is a possibility and the resulting incontinence will serve to increase the patient's misery.

"Microscopic examination should be done routinely, in early and in late case alike. There is not the smallest excuse either for dismissing the patient without such reassurance, or for instituting radical treatment without confirmatory evidence. Any method of diagnosis or any method of treatment not based on microscopic evidence is as unscientific as it is dangerous. The tissue for examination is more satisfactorily obtained by the knife or the punch than by the cautery, which may alter the structural relations, though cauterization of the wound edges should follow.

"A very valuable and simple test is that suggested by the late John G. Clark, that a sound be inserted and passed gently over all the cervical surfaces; malignant growths will invariably bleed under this trauma. Curettage is always indicated, even if the pars vaginalis is normal in appearance, when the intracervical mucosa seems granular or vascular.

"The microscopic diagnosis in late cases is merely confirmatory, in early cases it is all important, and often differentiation from a simple cervicitis is quite difficult.

"Tuberculosis and syphilis must likewise be differentiated. The former is rare, and the finding of the tubercle bacillus establishes the diagnosis. Syphilis (Gellhorn) is differentiated by the youth of the patient and the fact that she is often a prostitute; by pain on palpation, which is not characteristic of malignancy; by the earlier appearance of the syphilitic growth as contrasted with the reddish and spongy appearance of the malignant growth. Microscopic examination and the demonstration of spirochets are decisive."

The following is quoted from Curtis:<sup>7</sup>

"Hemorrhage, or a bloody discharge, is the only important clinical symptom. The amount of blood varies greatly; it may be slight, and may be observed on only one or two occasions. This fact is not well recognized. Particular emphasis must be placed upon the danger of ascribing to traumatism alone a spotting which first appears after douching or sexual intercourse; the bleeding of cervical cancer most often starts in this way.

"Hemorrhage from the uterus in a woman definitely beyond the menopause is always to be regarded as positive evidence of cancer until thorough examination demonstrates conclusively that no malignancy is present. During the childbearing period this most important symptom loses much of its value, because bleeding may be due to many other causes. After the menopause is well established, however, a cervical polyp is the only other frequent lesion which commonly gives rise to vaginal loss of blood (notable hemorrhage from polyps is unusual). A much less common cause of bleeding at this stage is a pedunculated fibroid tumor; the fibroid may appear at the cervix or may be concealed within the uterine cavity.

"Digital examination reveals friable tissue which bleeds freely upon palpation of the external cervix. No other objective symptom equals in importance the value of this evidence. Examination with the index finger is preferable to the employment of two fingers.

"Local extension is characterized by infiltration of the adjacent vaginal wall. Determination of the degree of broad ligament fixation is of the utmost importance; this necessitates careful bimanual palpation with notation of the mobility of the uterus as a whole. Deductions relative to the significance of thickening in the broad ligaments and adjacent tissues should be made with caution in those patients who have extensive ulceration of the cervix, and those who give history of a previous pelvic infection. Experience of recent years has revealed that many patients formerly considered "inoperable" may now be regarded more favor-

ably because fixation of the uterus is sometimes due to associated inflammatory exudates.

"The speculum should be used, but with due realization of its limited value. Inspection tells much less than palpation. It helps in the recognition of bleeding polyps which may be overlooked on digital examination. Questionable eroded surfaces may also be inspected and subjected to diagnostic study; but we must always bear in mind that visual differentiation between cervical erosion and early cancer is to be made with the utmost caution.

"Cancer of the endocervix often escapes detection. We see, repeatedly, patients with endocervix carcinoma who are declared normal because digital examination reveals no evidence of disease. *Every patient of cancer age with inexplicable passage of blood from the uterus* requires exploration of the interior of the uterus. Instrumental palpation of necrotic tissue or curettage of abundant pultaceous material is almost pathognomonic of carcinoma provided pregnancy can be excluded.

"Loss of weight, cachexia, pain, enlargement of the inguinal glands, swelling of the limbs, and offensive leukorrheal discharge are of minor value in the diagnosis of cancer of the cervix. These symptoms are late manifestation of the disease. The patient is already beyond help when they appear. The absence of pain and loss of weight in early uterine cancer deserve special mention. There is a widespread lay impression that freedom from these symptoms bespeaks absence of a malignant growth. This is frequently responsible for failure to seek consultation until the condition is hopeless.

"The differential diagnosis of carcinoma of the external cervix presents a serious problem for skilled internists as well as for general practitioners. Through repeated experience gynecologists have learned to recognize this disease without notable difficulty; failure to diagnose carcinoma of the endocervix is more common. carcinoma of the endocervix is more common.

"Simple erosions are superficial. They seldom bleed, and ooze but slightly, if at all, on digital examination. Friability is wanting.

"Bleeding fibroids are the cause of many errors in diagnosis. Necrotic tumors presenting at the cervix frequently simulate friable cancerous tissue. Cancer of the endocervix is sometimes overlooked in patients with fibroids of the body of the uterus, hemorrhage from the necrotic cancer being ascribed to the fibroids."

Quoting from Graves:<sup>8</sup>

"The total number of cured cases of carcinoma of the cervix has at least established a fact of prime importance, namely, that cancer of the cervix is frequently cured by the means at our disposal, the chances of cure being directly proportional to the timeliness of the attack.

"The logical conclusion is that every cancer of the cervix passes through a period, in its life history, during which it is theoretically 100% curable. This is the rock on which the hope of controlling the disease is at the present time based. Ultimate success depends on the co-ordinated efforts of every member of the profession,

who treats women at all, to detect and bring to treatment the early case.

"All clinical and pathological characteristics with which we are so familiar are those of advanced cancer. The standard symptoms of fetid discharge, bleeding, pain, the local changes of tumor formation, metastasis and ulceration, the histological picture of invasion and multiplication of cells, all are manifestations of comparatively late stages of the disease.

"It is difficult to realize how few incipient cancers of the cervix have until recently ever been detected and consciously treated. Only the merest handful have been reported in the literature, the discovery of such a case being usually by pure accident and hailed triumphantly as the rarest of finds. And yet since the incidence of incipient and terminal cancer is identical, patients must repeatedly be on our examining tables who without impairment of health, and often without symptoms, harbor a disease which at the same time is invisible to the keenest eye and intangible to the most sensitive touch.

"In the search for the early case it must first be recognized that the life history of a cervical cancer covers on an average from 10 to 12 or more years. This includes a long irritative stage of chronic *cervicitis*, and a shorter though still protracted period of *clinical latency*, during which the cancerous change though actually present does not attract the attention of the patient or her attendant.

"Until recently our best means of discovering cervical cancer in its latent stage has been the policy of timely repair of the inflamed cervix with a routine biopsy of the tissues. Many unsuspected cancers may be discovered in this way. But this policy has not been sufficiently widely adopted and there is still an unaccountable reluctance to repair dangerous cervicitis until the age of child-bearing is passed. Even when rigidly carried out the system has been open to frequent error. The pathologist unfamiliar with the incipient cancer-changes may miss the diagnosis. Or the operator with nothing to guide him may miss the cancerous area entirely in removing tissue for biopsy.

"In order to meet the difficulties of the situation it is evident that two things are primarily needed; first, a clearer knowledge of the histological appearance of an early cancer; and second some simple test by which the latent area may be accurately located for purpose of biopsy. In the efforts to solve these two fundamental problems the work of Walter Schiller, of Vienna, stands pre-eminent and has been taken as a basis for this report.

"The test is based on the discovery by Lahm that the upper layers of the normal epithelium of the portio and vagina contain rich masses of glycogen which disappear when the epithelium becomes cornified or changed by cancer. In the normal living tissue the glycogen of the upper layers of cells is stained in a few seconds a deep mahogany brown by iodine in watery solution (Lugol's). A superficial area of early cancer being devoid of glycogen does not receive the stain and stands out startlingly white or pink against



the deeply colored almost black background of the normal tissue.

"The test, simple as it seems, is not without its limitations. It appears to be completely reliable when it is clinically negative, that is to say when all the tissues take the normal stain. This claim made by Schiller has been repeatedly confirmed by our own biopsies. The test is therefore specific for determining the absence of cancer of the portio and vagina. This of itself is an inestimable aid.

"The stain does not take on glandular epithelium like that of the endocervix. Hence an eversion (ectropion) would appear pink. The same is true of the epithelium of adenocarcinoma, so that this type of cervical cancer must be sought for in the usual manner. Fortunately such cancer is rare.

"Ulcerations and erosions do not take the stain since they have no epithelial covering.

"The normal stain is prevented or obscured by slight trauma such as that from tenacula or scrubbing with gauze. This is caused by the rubbing off of the upper layers of epithelium in which the glycogen is chiefly deposited.

"Pus stains black since leucocytes are rich in glycogen. Necrotic tissue also stains black but clean, living granulations do not take the stain. A film of mucus prevents the stain. Blood and douche water obscure the reaction.

"Hyperkeratosis prevents the stain as in leucoplakia, lues and exposed areas in prolapse.

"Schiller's test is specific for cervical cancer, and is not adapted to other superficial cancers such as those of the vulva and skin in other parts of the body. This is due to the fact that the normal epidermis of the portio and vagina is not cornified and that the upper layers of cells contains a special chemical type of glycogen.

"The writer's technique (Graves) is as follows: A thick swab of absorbent cotton and gauze is prepared on the end of a stout wooden applicator. The swab is first immersed in the Lugol's solution until a copious amount of it has been absorbed. With the upper vagina well exposed by speculum or retractors the swab is then pressed firmly against the anterior lip of the cervix. The upper vagina is in this way flooded with the solution which instantaneously stains the normal tissues (excepting the mucous membrane of the endocervix) almost black. Any area of the portio no matter how small that does not take the stain must be regarded with suspicion. The suspicious area is then curetted with a specially sharpened spoon curette. The strip of epidermis thus secured is placed immediately in hardening solution and sent to the laboratory for biopsy."

*Carcinoma of the Corpus Uteri* (quoted from Miller")

"Fundal malignancy is principally a postmenopausal disease, and from 30 to 50% of the incidence is in nulliparous women, whereas cervical malignancy is pre-eminently a disease of the parous woman. Child-bearing (Graves) may actually inhibit the development of fundal malignancy, for the reason that it is primarily a disease of atrophy, and that atrophic changes are

particularly marked after the menopause in virgin and sterile women.

"Favorable circumstances are present, just as they are in cervical malignancy. The fact that the tumor originates after the menopause means that bleeding, the first symptom, attracts prompt attention. It grows comparatively slowly, because of its origin high in the uterus, where the musculature is thickest and most resistant and neighboring structures are relatively distant. It is not inclined to spread early by lymph channels, and its tendency to seed implantation is partially counteracted by stenosis of the tubes, the result of menopausal atrophy. On the other hand, it grows with malignant abandon when once the peritoneum is reached.

"The symptoms are practically those of cervical malignancy, though the order is somewhat different. Bleeding is apparent first in more than three-quarters of all cases. It usually appears after normal menstruation has ceased, as a slight pinkish spotting, which gradually increases in amount and frequency. The subsequent leucorrhea is typically watery and is seldom profuse, though sometimes it may be so free as to give the impression of urine. Both the discharge and the hemorrhage become purulent and offensive as ulceration and necrosis occur, and pyometra develops if there is interference with normal uterine peristalsis or if there is mechanical closure of the cervix.

"Pain is always a late symptom and is more marked in the back and thighs than in the pelvis. Kidney and ureteral involvement are not as frequent as in cervical carcinoma. Loss of weight, anemia, debility and other constitutional symptoms are typical of malignant growths in general, though the pronounced cachexia of cervical malignancy is rare.

"As in cervical malignancy, the diagnosis of fundal carcinoma is made on the history, the physical examination, and microscopic study. The history is extremely important, and *the occurrence of uterine bleeding, no matter how slight, in any woman after the menopause is in the vast majority of cases almost pathognomonic of fundal malignancy.* A leucorrheal discharge or pyometra is likewise very suggestive. The other symptoms are of little value, for they do not manifest themselves until the disease is far advanced.

"Bimanual examination in the early case is likely to be negative. At this time the Clark test, the insertion of a sound into the uterine cavity, is of great value, because of the tendency of even small areas of early malignant tissue to bleed on the slightest touch. In late cases the uterine body is enlarged and softened, and digital examination will sometimes reveal typical soft, friable masses filling the cavity, though it is quite possible for the wall of an atrophied uterus to be riddled with cancer with no perceptible increase in size.

"*Curettage with microscopic study of the scrapings is the only safe method of diagnosis.* It should be done under anesthesia, to be certain that no areas are omitted, and special care must be taken to include the cornual regions. If the malignancy is at all advanced, the curette will detach friable white, cheesy material in long strips, but diagnosis on gross inspection is never warranted. Curettage should be done routinely in all

operations on women in the cancer age, even when malignancy is not suspected, for many cases of fundal malignancy in early stages are thus brought to light. It is particularly important that it be done before irradiation for fibroids or metropathic bleeding, for irradiation is not the treatment of choice in the average case of fundal carcinoma.

"We have always believed that the laboratory study should be done promptly, so that the necessary surgery might follow at once on the discovery of the neoplasm, and Sampson's work, which has proved the possibility of implantation metastases, has emphasized the importance of this precaution. Theoretically his investigations might seem to suggest that in view of the dangers inherent in curettage and instrumentation, it might be wiser to omit the procedure altogether, but practically such a course could result only in disaster, since it would mean the impossibility of diagnosis in most early cases."

The following is quoted from Curtis:<sup>10</sup>

"Stacy calls attention to the frequent coincidence of uterine myomata and carcinoma of the fundus; myomas and polyps apparently predispose to the development of fundus cancer.

"A large percentage of so-called 'cancers of the body of the uterus' really have origin in the endocervix and extend secondarily upward into the uterus.

"In patients well beyond the menopause diagnostic curettage is often unnecessary. Profuse bleeding from an organ of generous size is highly suggestive. The additional evidence of passage of endometrium-like tissue upon dilation of the cervix may suffice. Free bleeding upon palpation of the interior of the uterus with a sound (John Clark test) is pathognomonic of cancer provided pregnancy and necrotic polypoid fibroids can be excluded. Curettage, if required, must be performed with caution; the uterus is often very soft and easily perforated. Use of the curet is followed by low-grade acute endometritis in a considerable percentage of cases; if hysterectomy is required it should be performed immediately, before possible development of infection. Delayed operation after curettage should be postponed at least three weeks, until subsidence of the inflammation.

"The microscope does not always yield distinctive evidence. Occasionally one encounters glandlike masses of endometrium without definite malignant changes. At such times, in differentiation from benign hyperplasia of the endometrium, much weight attaches to the fact that cancerous growths yield an unusually abundant amount of tissue on curettage.

"Differentiation from retained products of conception gives rise to occasional uncertainty in the operating room. The age of the patient may be helpful, although we know that islands of placental tissue may remain viable in the wall of the uterus for a period of several years. Microscopical examination is usually conclusive.

"Uterine polyps of large size and pedunculated fibroids produce similar symptoms. They may also yield excessive amounts of curetted tissue. The histologic examination of an adenocarcinoma may fail to reveal unquestioned evidence of malignancy, thus adding

another confusing item. In doubtful cases the patient most often has a cancer. The frequency of sarcoma makes this lesion of lesser importance in differential diagnosis; curetted pieces are usually red-white, brain-like masses."

Healy<sup>11</sup> states:

"Cancer of the corpus is much more common after the termination of the normal menstrual life, in other words, after the menopause, and may therefore be regarded as a disease of old age.

"The greatest number of cases occur in the sixth decade of life and in our own series of 102 cases the average age was 54.7 years. The youngest patient was 19 years of age, the oldest 76, and only four patients were under forty.

"Fertility and childbearing are not as common in women who develop cancer of the corpus as they are in those with cancer of the cervix. About 25% of our cases of corpus cancer were nulliparae, whereas only about 8% of our cases of cancer of the cervix were nulliparous.

"The association of cancer of the body with fibromyoma would seem to be important. Norris and Vogt report 20.8% of their cases of body cancer were associated with fibromyomata. Graves states that fibromyomata were present in 25.7% of his cases. Stacy, in a series of 269 cases operated on found 33.45% with fibroids. Burnam, on the other hand, found only 12% with fibroids and makes the interesting observation that corpus cancer is extremely rare in negroes despite the fact that uterine fibromyomata are very common.

"A uterine discharge, either watery, leukorrhoeal, or bloody, is the only symptom observed by the patient. It is quite important to note that at first in nearly every case the discharge is intermittent, and especially so as regards the bleeding, which may be absent for days or weeks at a time, possibly because of atresia of the cervix. However, if the case is not treated the discharge and bleeding eventually become continuous.

"Very few cases of corpus cancer occur before the menopause, therefore the presence of a uterine discharge and especially of uterine bleeding after the menopause has once been established should create grave suspicion of the presence of corpus cancer, particularly if the cervix appears normal.

"Pain is not an important symptom in corpus cancer. It is rarely present while the disease is confined to the uterus but occurs in later stages when the cancer has spread to other structures.

"Occasionally, in the earlier stages of the disease, a patient may experience uterine cramps and so-called "menstrual pains" associated with a feeling of weight, pressure and bearing down in the pelvis. Such symptoms are usually intermittent, and are due to retention of the uterine discharge because of atresia of the cervix. They are promptly relieved when the intrauterine pressure overcomes the atresia.

"Pyometra occurs but is not common and is much less frequent than with carcinoma of the cervix."

*Leucorrhoea.* The frequency with which leu-



corrhea is found to be the reason for women consulting physicians and the countless numbers of divergent treatments for the condition has led to considerable investigative work along that line in recent years. Cruickshank,<sup>12</sup> Karnaky,<sup>13</sup> Adair,<sup>14</sup> Plass<sup>15</sup> and Roblee<sup>16</sup> are among the recent investigators. Schultheiss in 1929 determined the hydrogen ion concentration on centrifugal vaginal washings, and Plass in 1936 determined the pH of a small amount of vaginal discharge collected directly from the vagina. Adair has shown from biopsies of vaginal mucosa that the normal vagina has a general distribution of glycogen, especially in the lower epithelial layers. Where there is vaginitis the glycogen content is diminished.

Roblee in a recent presentation before the St. Louis Medical Society said in speaking of the "Effect of Acids and Alkalies on Cervicitis and Vaginitis":

"I have been technical but only to establish a clear understanding of the nature of vaginitis, and vaginitis as an etiological factor in cervicitis as a result of ascending infection. It is not sufficient prophylaxis to do good obstetrics, to use cautery on the cervix during the post partum period, or to use some operative procedure such as a Sturmdorff operation, or to do surgical diathermy of the cervix to effect a cure for chronic cervicitis. A vaginitis can produce a cervicitis just as much as a cervicitis can produce a vaginitis. I do not mean that a chronic cervicitis can be cured by curing the vaginitis, and the converse is equally true.

"To effect a cure of chronic cervicitis I consider it necessary that the entire diseased gland bearing area of the cervix be removed by some suitable method; and I now wish to add to this the statement that the vagina must be kept acid in reaction as a prophylactic measure. When the cervix is diseased acutely, subacutely or chronically, the normal alkaline discharge is more alkaline; that is, the pH is higher, 7.8. This means that the vagina will be markedly alkaline and becomes the incubating test tube for any and all virulent pathogenic organisms, which in turn keeps alive the cervicitis by ascending infection. To use antiseptics in the treatment of cervicitis or vaginitis becomes of little or no value except in the immediate transitory local action of the application. The racemose glands of the cervix become permanently blocked by the mechanism of healed cervical erosion as the squamous epithelium grows back over the columnar epithelium extension which has caused the erosion. Thus it is necessary to structurally remove this lesion in order that the downpouring of a strongly alkaline pathogenic stream into the vagina be stopped. In order to get the cervix ready for surgery or surgical diathermy procedures, acid applications to the vagina and time bring about a subsiding of the acute and subacute cervicitis and vaginitis. When the vagina is sufficiently acid no patho-

genic organisms can exist in a pH of 4.0 for any period of time. It is not possible or advisable to make the cervix anything but alkaline in reaction, although excessive alkalinity can be corrected by the structural removal of the diseased gland bearing area of the cervix. This stresses the importance of increasing the acidity of the vagina.

"To accomplish a dual purpose of supplying acid to the vagina and glycogen to the sub-epithelial layers of the vagina, Adair and Hesselstine recommend the use of a mixture of lactose 95% and citric acid 5%. The bacteria in the vagina ferment the lactose, producing lactic acid, and glycogen is absorbed by the vagina. This brings about normal vaginal conditions.

"In an attempt to find something that would prevent the troublesome vaginal discharge during the sloughing period following surgical diathermy of the cervix I have been using the anhydride of lactose alone; the trade name of which is Beta Lactose. This preparation of lactose is soluble 30 parts per hundred whereas lactose is only soluble 6 parts per hundred. This means that the Beta Lactose will more readily absorb the moisture in the vagina and adhere to the vaginal walls as a smooth white coating. The technic that I am now using consists in placing a bi-valve speculum into the vagina without the aid of any lubrication that would change the pH of the vagina. A neutral cotton swab is used to remove moisture in the vaginal mucosa just inside the introitus, and this material is touched to a Nitrazine paper, and a reading is taken from it to determine the vaginal pH. A glass rod may be used in place of the cotton swab. Another application may similarly be made from the vagina in the region of the posterior and anterior vaginal fornix. A third application is taken from the cervical canal. The color attained on the Nitrazine paper is compared with a Nitrazine chart which is lemon yellow with a pH of 4.5; and is a dark, almost navy blue at 7.5. The normal pH of the vagina just inside the introitus should be 4 to 4.5. The vaginal fornix may read 5 which is a mustard color, but should not be green as the green develops at a pH of 5.5 to 5. The cervical canal may be a dark green or a light blue 6.5 to 7. If there is a cervicitis present, the cervical canal will be a very dark blue 7.5+ due to excessive alkalinity of the diseased cervix."

"In trichomonas vaginitis, you may expect a vaginal secretion reaction from the introitus to be definitely green about 5.5 to 6. The vaginal fornix, and even the vaginal portion of the cervical secretion may or may not be changed depending on the presence or absence of an associated vaginitis. Pyogenic pus forming organisms will give a grass green to blue color taken from the vaginal introitus. Occasionally, one sees excessive vaginal discharge with a pH reading of 4.5 to 5.0 in the introitus and vaginal fornix, and even the vaginal portion of the cervix as well. It has been my experience that in

all of these cases, the infected organism is united with mycosis, fungus or yeast forming organisms which grow in and produce an acid environment. Smears are taken and stained with carbolfuchsin; from such cases the only bacteria seen are the rod bacilli, normal inhabitants of the acid vagina, plus of course, the infecting mycosis organisms.

"This brings up the reason for using lactose sugar, preferably the anhydrous lactose or beta lactose, for the acid forming vaginal organisms of the mycosis group cannot ferment a lactose sugar. Hence, the use of lactose will not make the condition worse, and if a small amount of powdered resorcin be mixed with the lactose and applied directly through the speculum or in a large vaginal capsule, instead of the boric acid, excellent results will be obtained in freeing the vagina of the mycosis and yet maintain a normal vaginal environment. In concluding this technique, one might say that the pH readings obtained with the Nitrazine paper determines your immediate office treatment, which consists of filling the vagina with anhydrous beta lactose mixed with a small amount of boric acid powder or resorcin powder, and a vaginal capsule prescription of the same to be inserted by the patient, herself, at intervals of every second, third or fourth day depending upon the severity of the infection and the vaginal pH reading. Douches are limited to once or twice a week and consist of 3 tablespoonfuls of white vinegar to 1 quart of warm water. Once a week is preferable to twice a week especially during the menstruation. During each day of the menstruation, the warm douches should be taken instead of the capsule."

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#### CARDIAC REVIEW OF 1936

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*General Remarks:* Maddox stated that dyspnea, the earliest symptom of heart disease, in its milder forms, is tolerated by the patient, who contents himself with the philosophy of increasing years so that when the physician is finally consulted, the cardiac reserve is already low; thus the physician has the difficult task of assessing what remains, of steering a course between pessimism and over-optimism and of detecting or avoiding the addition of the fearful cloak of neurotic anxiety.

#### 1. ANATOMY AND PHYSIOLOGY

Wearn, Bromer, and Zschiesche,<sup>2</sup> reporting on the incidence of blood vessels in human heart valves, noted that in the examination of 88 hearts without evidence of previous inflammation, blood vessels were found in one or more of the valves in 84% of the cases. Abramson and Margolin<sup>3</sup> presented evidence that the anatomic concept of the ventricular conduction system is incomplete as the Purkinje arborization of the ventricles, which is generally believed to be only subendocardial in location, is demonstrated to ramify throughout the outer ventricular wall and in the interventricular septum. DeWaart, Storm, and Koumans<sup>4</sup> stated that after experimental ligation of the coronary arteries the chance of ventricular fibrillation is greatest during the first forty minutes, but if it did not develop within five days, it did not set in. They observed bundle-branch block after left coronary artery ligation; sino-auricular block, A-V block, and shifting of the pacemaker were observed after right coronary ligation. Messina<sup>5</sup> found that the average amount of creatinemia is 7.15 mg. in patients suffering from cardiac diseases in compensation, and 12.27 mg. in the same type of patients having decompensation; the total hypercreatinuria in these

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cases is due to metabolic disturbances of the myocardium rather than to retention of creatin and creatinine in the blood due to renal insufficiency. Kindler<sup>6</sup> found creatine in the urine of all his cases of severe cardiac insufficiency; it disappears again as the circulatory conditions improve. Herrmann, Decherd, and Schwab,<sup>7</sup> from their experimental work, stated that digitalization increases the creatine concentration in normal hearts; in hypertrophied hearts it keeps the relative percentage of creatine high and thus further adds to the increased total creatine of work hypertrophy. Wiggers and Green<sup>8</sup> experimented with various dilating drugs to note the effect upon the collateral flow after experimental coronary occlusion in dogs; they concluded that in dogs an increase in collateral circulation sufficient to be of functional use cannot be obtained by means of these drugs after complete coronary occlusion. Harrison, Friedman and Resnik,<sup>9</sup> in a discussion on the mechanism of acute experimental heart failure, stated that an increase in work produced either by increasing the cardiac output or by raising the blood pressure causes an increase in the mechanical efficiency of the heart; in the intact animal heart failure is characterized by an increase in the volume of the heart and a decrease in the mechanical efficiency.

## 2. METHODS OF CARDIOVASCULAR EXAMINATION

1. *Electrocardiography*: Breed and Faulkner<sup>10</sup> described cases of right axis deviation in a normal vertical heart, left axis deviation in a normal transverse heart, T-wave alterations due to deep breathing, functional bundle-branch block and transient inversions of the T-waves as sources of error in clinical electrocardiography. The testimony furnished by the electrocardiogram can be properly evaluated when all the evidence is in, or occasionally it will deceive us; it will tell the truth, but not the whole truth. Burnett and Taylor,<sup>11</sup> from a study of electrocardiograms on 167 healthy children and infants, noted sinus arrhythmia, seen most frequently in the 10th and 11th years, in 21.8% of the records. Kurtz, Bennett, and Shapiro<sup>12</sup> obtained electrocardiograms on 109 patients during 113 surgical operations under various anesthetic agents; disturbances of rhythm constituted the most striking changes noted, sinus arrhythmia, extrasystoles and downward displacement of the pacemaker predominating, but for the most part all were

of a transient nature. Missal and Crain<sup>13</sup> presented an unusual case demonstrating electrical alternation of the QRST complexes without alternation of the pulse in a patient who had occasional attacks of syncope and convulsions. An active carotid sinus reflex was present and may have been a factor in producing the symptoms; the patient has shown clinical improvement during an observation period of 3½ years. Hamburger, Katz, and Saphir<sup>14</sup> reported that in a case of transient electrical alternans, autopsy revealed an anomalous distribution of the right coronary artery with a calcified plaque markedly narrowing its mouth, generalized coronary arteriosclerosis and multiple myocardial infarcts. In a second case of possible alternans, autopsy revealed multiple minute carcinomatous infarcts within the myocardium and in the blood vessels of the heart. Sigler and Schneider<sup>15</sup> reported the case of a 36 year old male knocked unconscious by an electric shock for about two minutes and the heart rhythm was found to be totally irregular after that until it returned to normal in about three hours. Eufinger and Molz<sup>16</sup> reported electrocardiographic studies on 17 women with severe preclampsia and on six women with eclampsia; there was no electrocardiographic evidence of direct cardiac impairment by the eclampsia. Cushing<sup>17</sup> described a case of trichinosis in a 27 year old male who showed inversion of the T-wave in the second lead and an upright T-wave in the fourth lead of the electrocardiogram, and as the patient recovered, these changes gradually disappeared. Hecht<sup>18</sup> showed that a number of electrocardiographic curves obtained from the customary leads cannot be subjected to an exact clinical evaluation, and it is hoped that with leads from the thoracic wall it will be possible to explain these obscure conditions.

2. *Roentgenography*: Roesler<sup>19</sup> challenged the statement that a failing heart diminishes in size as compensation becomes restored; this is possible, but more often pericardial fluid has been merely resorbed or the position and the shape of the heart changed as the size of the liver decreased. McGinn and White<sup>20</sup> demonstrated that the presence of epicardial fat at the cardiophrenic angles, especially on the left side just beyond the cardiac apex, may be a source of error in measuring the heart shadow on roentgenograms ("7 foot" heart films) and may be misinterpreted as cardiac enlargement. Levy<sup>21</sup> emphasized the

importance of pulmonary congestion as a factor in the atypical situation and roentgen appearance of pulmonary infarcts as residua of infarct shadows may persist over months and years. Schwedel and Epstein<sup>22</sup> visualized roentgenologically not only the pulmonary artery but also its main branches in normal and abnormal cases. The size of this vessel and its branches is of value in the recognitions of congenital lesions of the heart or lesions of the pulmonary arterial system in the absence of clinical signs. Spencer and Dresser<sup>23</sup> reported three cases of right sided aorta; in two of these there was an erroneous diagnosis of mediastinal tumor. The examination of the esophagus, the most important point in establishing the diagnosis of right sided aorta, shows displacement to the left at the level of the clavicle in the A-P view, while in the oblique and lateral views the esophagus is displaced anteriorly; narrowing of the esophagus is seen in all views. Scott and Moore<sup>24</sup> stated that roentgenkymography, a relatively new and efficient aid in diagnosis, is another help in the differential diagnosis between aortic aneurysms and mediastinal tumors, as it records the movement of the heart chambers and great chambers. They<sup>25</sup> described roentgenkymographic tracings diagnostic of certain types of heart disease. Gillies and Kerr<sup>26</sup> stated that at the present time the limitations of the roentgenkymograph in the study of the heart are mainly those of the roentgenologist and that the value of its practical application will increase directly with our ability to correctly interpret the kymograms.

3. *Other Methods:* Wood<sup>27</sup> performed the erythrocyte sedimentation rate in 164 cases of heart disease. He noted that congestive heart failure retards the sedimentation rate, regardless of the cardiac pathology and may therefore mask the activity of the disease process. Increased sedimentation rates were found in cases of active rheumatic carditis, syphilitic aortitis and myocardial infarction. Oppenheimer and Hitzig<sup>28</sup> used circulatory measurements in evaluating pulmonary and cardiac factors in chronic lung disorders and stated that uncomplicated pulmonary insufficiency, as is commonly observed in emphysema, is usually attended by normal circulatory measurements, even when associated with right ventricular enlargement. The presence of abnormal circulatory measurements indicates that the pulmonary insufficiency is complicated

by myocardial failure. In chronic bronchopulmonary disease there is apparently no parallelism between the severity of clinical symptoms and the slowing of the pulmonary blood flow. Gior-dano<sup>29</sup> made determinations of the bilirubin in the blood of patients suffering from decompensated heart disease and concluded that the quantity of bilirubin in the blood and the intensity of the reaction, whether direct or indirect, runs parallel to the clinical evolution of the heart disease. The appearance of a direct reaction associated with an increase of the bilirubin in the blood has an unfavorable prognostic significance. Cohen<sup>30</sup> described a new instrument for the determination of venous pressure by a direct method; this new apparatus allows the introduction of venous medication without being detached, so that the effects of drugs on venous pressure may be studied.

### 3. SYMPTOMS AND SIGNS

Baker,<sup>31</sup> from the statistical and clinical study of a large group of patients, stated that palpitation can be the main symptoms in patients without any physical signs of cardiovascular disease, and in these cases it is associated with a diffuse array of complaints expressive of physical and nervous exhaustion. Palpitation can also be the chief complaint in patients suffering from thyrotoxicosis, hypertension, or paroxysmal tachycardia, but the clinical picture is different and there are added signs and symptoms associated with these diseases. Palpitation is rarely the primary complaint of patients suffering from rheumatic heart disease. Lyon<sup>32</sup> stated that his experience in recent years has led him to question whether we are not becoming overcautious in evaluating cardiac pain and its significance, as coronary occlusion may occur without angina as a forerunner, and that an individual, especially one past middle age, may have two coincident but unrelated disease conditions. The significance of cardiac pain can be rightfully evaluated in the majority of cases only by a close, painstaking questioning of the patient designed to differentiate sharply the various types of pain. Ernstene and Knowlton<sup>33</sup> stated that cardiac asthma is due to sudden failure of the left ventricle, which has been damaged previously as the result of hypertension, or coronary artery sclerosis, or aortic valvular disease; in a small group of patients with uncomplicated mitral stenosis



similar attacks occur as the result of factors which suddenly increase the heart rate. Robey<sup>34</sup> stated that murmurs are merely a part, sometimes a very small part, of the complete cardiac examination. During the course of acute infections, especially rheumatic fever, there should be no haste on the part of the medical attendant to reach a conclusion concerning a murmur, as convalescence may entirely change the cardiac findings. Thompson and Levine<sup>35</sup> compared the accuracy in the diagnosis of single and multiple valvular disease of the heart by correlating the clinical and postmortem findings. They noted that the diagnosis of aortic stenosis is more accurate when the lesion exists in combination with deformity of other valves than when the other valves are normal. The diagnosis of aortic insufficiency is less accurate when other valves are also involved. The condition of the other valves made no difference in the accuracy with which lesions of the mitral valve are recognized. Steele<sup>36</sup> stated that fever in heart disease accompanies non-infectious as well as infectious processes, but the form that the fever assumes exhibits certain differences dependent upon the nature and severity of the process with which it is associated. Bronchopneumonia appears to be a less common affection in heart failure than is generally supposed, as evidence exists that fever accompanies the process of heart failure itself.

#### 4. ETIOLOGY OF HEART DISEASE

1. *Congenital*: McGinn and White<sup>37</sup> reviewed 7,500 postmortem examinations and their clinical records at the Massachusetts General Hospital and noted congenital defects that were found in 67 hearts (0.9%), of which 21 were infants under one year of age; abnormalities of the heart valves and anomalous coronary arteries comprised a large portion of the cases and undoubtedly prevented a higher percentage of accuracy in clinical diagnoses because of the failure of these lesions to give clinical signs. Tarnower and Woodruff<sup>38</sup> cited the case of a widely patent foramen ovale in a 77 year old woman who was well until advanced age, which illustrates the rather benign nature of a large interauricular septal defect when unaccompanied by a valvular lesion. Koritschoner<sup>39</sup> reported the occurrence of paradoxical embolism, the passing of a blood clot from the right side to the left side of the

heart through the patent foramen ovale, in a 63 year old woman who died unexpectedly six days after a uterine suspension. Arkin<sup>40</sup> presented six cases of a clinically new aortic anomaly which consists of a total persistence of the right aortic arch combined with a persistence of the left aortic arch in the form of the left subelavian artery, an isthmus stenosis, and a diverticulum of the aortic arch. The clinical signs noted were dullness to the right of the sternum, visible systolic pulsation in the second and third right intercostal spaces, a strong palpable pulsation in the right supraclavicular fossa, a maximum intensity of the aortic sounds in the region of the head of the right clavicle, slight displacement of the trachea to the left and a tracheal tug. Talley and Fowler<sup>41</sup> reported the case of the tetralogy of Fallot, the Eisemenger type, consisting of pulmonary valvular insufficiency without obstruction, interventricular septal defect, deviation of the aorta to the right and hypertrophy of the right ventricle of the concentric type, in a woman who died at the age of 31 years. She was a blue baby, had a normal physical and mental development, but passed through two pregnancies and was able to take care of her house until within a month of her death. Kissin<sup>42</sup> described the case of pulmonary insufficiency in a 41 year old female who had a loud diastolic murmur at the base of the heart and in whom a supernumerary cusp was found in the pulmonary valve at necropsy.

2. *Rheumatic*: Nichol<sup>43</sup> reviewed the available data to indicate that there is a definite inequality in the distribution of rheumatic fever and rheumatic heart disease in the United States. Only 1.3% of the "cardiac" patients found in Miami, both in hospital and office practice, had rheumatic heart disease determined clinically to have been acquired during life or residence in the South, compared to a recent estimate that 31.9% of the "cardiac" patients encountered in New England were of the rheumatic type. Werner<sup>44</sup> analyzed the association of active rheumatic fever with heart failure in 100 consecutive cases of rheumatic cardiac disease with congestive failure studied in the wards, in 75 cases of the same condition studied at autopsy, and of 50 cases of syphilitic cardiac disease included for the same purpose. Signs of active rheumatic fever were demonstrated in 45% of the clinical cases of rheumatic cardiac disease and activity was suspected in an additional 21%. In the patho-

logical material, active rheumatic lesions were found in 66% of the cases of rheumatic cardiac disease. Bland, Jones, and White,<sup>45</sup> from a follow-up of 1,000 children and adolescents with rheumatic heart disease, showed that certain physical signs considered characteristic of valvular disease may occasionally regress and ultimately disappear. This favorable sequence of events was observed during the course of ten years in 83 cases (8.3%). In not one single patient did they observe the disappearance of either a very loud diastolic murmur ending in a loud crescendo presystolic roll or a loud aortic diastolic murmur and the peripheral circulatory signs of free aortic regurgitation. Friedberg and Gross,<sup>46</sup> from a study of the pericardial lesions found in 87 cases of active and inactive rheumatic fever, noted that rheumatic disease of the heart is almost invariably associated with certain inflammatory changes in the pericardium. Gibson and Denenholz<sup>47</sup> reported a clinical and postmortem study of 73 cases of rheumatic heart disease in childhood which revealed that predisposing causes of the rheumatic infection, such as sore throats, chronic tonsillar infection and scarlet fever, were encountered with less frequency than was anticipated. The first attack of carditis proved fatal in 40%; auricular fibrillation was infrequent, occurred in older patients and was usually a terminal event. The average duration of life was longest when the attack began with chorea, less prolonged when joint pains initiated the infection, and shortest when the invasion of the heart itself was the only evidence of rheumatism. Bland and White<sup>48</sup> stated that relatively young people with severe angina pectoris complicating rheumatic heart disease appear to be an unusually suitable group for the relief of pain by paravertebral alcohol injection of the thoracic sympathetic rami communicantes. Attention is called to the probable importance of active cardiovascular disease, either luetic or rheumatic, as an essential feature of atypical angina pectoris in young people with free aortic regurgitation. Gross and Fried<sup>49</sup> reported a high incidence of inflammatory and vascular lesions in the auriculoventricular conduction system; 66% of 60 hearts from patients who had had active rheumatic fever showed these lesions in the conduction systems.

3. *Bacterial*: Sutherland and Willis<sup>50</sup> reported the case of an 18 year old male with an ulcerative

mitral endocarditis due to a diphtheroid bacillus structurally and culturally resembling the diphtheria bacillus. They emphasized the point that, although diphtheroids in blood cultures are usually considered contaminants from the skin, the possibility of these bacilli having clinical significance should not be overlooked. Riesman, Kolmer, and Polowe<sup>51</sup> stated that splenectomy for subacute bacterial endocarditis is well borne, even in far-advanced cases, but it has not so far been followed by a permanent sterilization of the blood stream in cases in which the blood stream infection existed; in each of the cases reported life was prolonged and made more comfortable, but this did not prevent the major cause of death in these patients, embolism. Segal<sup>52</sup> studied 192 cases of bacterial endocarditis, 67 with electrocardiograms, and found only four cases of auricular fibrillation and two of auricular flutter. The occurrence of auricular fibrillation and flutter in the course of bacterial endocarditis appears to be related to the functional integrity of the myocardium rather than to any grade of underlying mitral stenosis in itself. Lehmann<sup>53</sup> reported the occurrence of coronary thrombosis in a 53 year old male with infarction of the papillary muscle and shortening of the chordæ tendinæ of the mitral valve; this handicapped mitral valve, though free of any previous inflammatory disease and of congenital anomaly, later became the site of subacute bacterial endocarditis. Kearns<sup>54</sup> described a case of malignant endocarditis of the mitral and aortic valves due to *Bacillus pyocyaneus* in a debilitated 35 year old male who was addicted to the use of drugs; the condition apparently followed cutaneous abscesses at the point of injection of the drug. The essential pathological feature was the transformation of the cardiac valve into necrotic granulation tissue which harbored enormous numbers of the bacteria. Cooke<sup>55</sup> reported a case of acute bacterial endocarditis complicating a congenital defect in the interventricular septum in a 12 year old boy; the physical findings of pulmonary stenosis were explained at autopsy by a mass of vegetations which arose from the margins of the septal defect and almost completely filled the pulmonary valve orifice. This case illustrates the inaccuracy of a diagnosis of congenital pulmonary stenosis in the absence of right axis deviation in the electrocardiogram. Rennie and Young<sup>56</sup> reported a fatal case of malignant endocarditis



of the mitral valve due to *Brucella abortus* in a 47 year old male, ill ten weeks. Giddings<sup>57</sup> described the occurrence of bacterial endocarditis of the aortic valve in a child of two months and also the death of a four day old infant from pneumococcic endocarditis; both were males of a pair of binovular twins, a boy and a girl in each pair, and the other twin in each case appears perfectly healthy and is thriving. Harkness<sup>58</sup> cited the case of a 32 year old male who showed definite evidence of a bacterial endocarditis and blood agglutination tests showed *Brucella abortus* infection; the patient lived 2½ years and died of acute pulmonary edema. Autopsy revealed mitral and aortic endocarditis, both valves being fibrosed and covered by gritty vegetation, but neither *Br. abortus* nor Gram-positive cocci were cultured from the vegetations. Ernstene and Lawrence<sup>59</sup> presented clinical and postmortem observations on a 46 year old male with advanced mitral stenosis, regular heart rhythm, subacute bacterial endocarditis and an occluding thrombus of the left auricle. The striking clinical feature was the occurrence of an attack of typical cardiac asthma accompanied by tachycardia and signs of greatly impaired peripheral circulation, the latter signs persisting after subsidence of the paroxysmal dyspnea and the tachycardia. Cohn<sup>60</sup> reported a case of gonococcic endocarditis in a 38 year old male, who had a positive blood culture but had no history or anatomic evidence of gonorrhea except possibly the enlarged prostate and seminal vesicles. The positive complement fixation test was contraindicated by the equally positive Widal, so that the serologic examinations only confused the clinical picture. The postmortem examination, while confirming the clinical diagnosis of ulcerative endocarditis, gave no hint as to the etiology. There was no evidence of previous cardiac damage or defect, so that this is one of those exceptional cases in which gonococci, invading the blood stream, caused inflammation of a normal endocardium. Clarke and Haining<sup>61</sup> reported the occurrence of a fatal endocarditis of the pulmonary and mitral valves in a 15 year old Japanese girl due to an organism that is rarely pathogenic, the *Neisseria catarrhalis*.

4. *Syphilitic*: Arkin<sup>62</sup> stated that the earliest and most important diagnostic sign of syphilitic aortitis is the demonstration of a widening of the ascending aorta or any other part of the aorta

on fluoroscopic examination. The second most important sign is the increased manubrial dullness. The third most important finding is the tambour or bell-like, ringing second aortic sound. A fourth frequent finding is a systolic murmur at the base, found in 66% of the cases of uncomplicated syphilitic aortitis, but the murmur alone is not diagnostic of this condition. Cole and Usilton<sup>63</sup> reported extensive cooperative clinical studies on cardiovascular syphilis from which the following were noted: the frequency of incidence of uncomplicated syphilitic aortitis was 4.9% or 326 patients, of which 10% had the infection less than five years; the average duration of life in patients who died had been increased from 34 to 85 months when adequate treatment was given after the detection of the aortitis; and the average duration of life for patients who had been treated with large doses of arsenicals was 20 months longer than that for patients who had been treated with small doses of the same drug. Aortic regurgitation<sup>64</sup> was observed 20 to 30 years after the infection in 260 cases, and average duration of life was increased from 40 to 55 months with adequate treatment after the detection of the valvular lesion; the average duration of life for the patients with aortic regurgitation who died was 30 months when congestive heart failure was present before treatment and 47 months when congestive heart failure was not present. Seventy-four cases of aortic aneurysm<sup>65</sup> were included, of which 77% had not been treated prior to the detection of the aneurysm; the average duration of life after the detection of the aneurysm in patients receiving an adequate amount of potassium iodide was 37 months, which increased to 75 months when adequate antisyphilitic treatment was given. Libman<sup>66</sup> cited the case of a white male, now 42 years of age, who, when first examined in 1912, had all the signs and symptoms of aortic aneurysm; he was seen again in 1929 and complete examination revealed no signs of aneurysm; when re-examined in 1935, he was well with negative signs. The only residuum 22 years after the original diagnosis of aortic aneurysm was a slight weakness of the abductors of the vocal cords. Reifenstein<sup>67</sup> described the case of a 26 year old white male who had the history, physical and laboratory findings, electrocardiographic evidence and the clinical course usually considered characteristic of acute myo-

cardial infarction. The age of the patient, the history of syphilis and the secondary skin manifestations, justified the admission diagnosis of myocardial infarction from closure of the ostium of the coronary arteries due to syphilis; however, because of the duration of the illness, the final antemortem diagnosis was acute myocardial infarction due to coronary thrombosis. Autopsy revealed patent coronary arteries and active granulomatous myocarditis with multiple caseating foci but no spirochetes were found in the heart muscle. Richter<sup>68</sup> described a case of true syphilitic endocarditis of the heart valves as treponema were found in the cusp and aortic valve ring; two rarely associated cardiac anomalies were also present, congenitally bicuspid aortic valve and subaortic stenosis, the latter clinically producing signs of aortic stenosis in the anatomical presence of aortic insufficiency, which led to a diagnosis of rheumatic aortic stenosis and insufficiency. Zimmerman-Meinzingen<sup>69</sup> warned against the underestimation of certain neurotic traits that occur in patients with syphilitic coronary stenosis, such as constant unrest, anxiety or excitation, because a coronary stenosis frequently exists in these patients with mesaortitis. Syphilitic coronary stenosis may exist for a long time, however, without giving rise to complaints, as the subjective difficulties are frequently of short duration and fatalities occur occasionally in apparent health.

5. *Thyrotoxic*: Maher and Sittler<sup>70</sup> stated that congestive heart failure is not present in uncomplicated thyrotoxicosis, but the presence of this phenomenon is associated with the coexistence of a structural cardiac lesion. Abnormal cardiac physiologic function, as determined clinically or demonstrated objectively by the electrocardiogram, such as all types of heart-block and auricular fibrillation, appears to be manifestations of the primary organic cardiac disease modified by the element of thyrotoxicosis. In general, the effect of the thyrotoxicosis seems to be that of a catalytic agent as the course of the organic heart disease progresses more rapidly when the thyrotoxicosis is active; often it brings to the surface latent cardiac lesions, which resume their latency on the successful termination of the thyrotoxicosis. They believe that the next step in the further reduction of surgical mortality and morbidity of thyrotoxicosis lies in the recognition and proper management of all associated patho-

logic changes, particularly in the cardiovascular system. Feldman<sup>71</sup> is of the opinion that the heart in thyrotoxicosis suffers from overwork because of the demands by the tissues for more oxygen and because of the increase in the intrinsic metabolism of its own fibers. Thyrotoxicosis itself seldom produces congestive heart failure but this develops with auricular fibrillation in a normal heart, with auricular fibrillation and coincident cardiovascular disease, or with sinus rhythm and coincident cardiovascular disease. Cookson<sup>72</sup> reported the case of a 38 year old white female with a coarctation of the aorta who went through two normal labors and began to have symptoms of toxic goiter; complete thyroidectomy was performed and the toxic symptoms cleared up.

6. *Myxedema*: Higgins<sup>73</sup> concluded from experimental evidence and the available postmortem findings that changes in the cardiovascular system in myxedema are of frequent occurrence. In the early stages of thyroid deficiency it is probable that there is a mucin-like infiltration of the muscle-fibers which can be overcome by the judicious use of thyroid extract. As the disease progresses further degenerative changes occur which is characterized by a definite enlargement of the heart and development of sclerotic changes in the arteries. The heart in myxedema is a distinct clinical and pathologic entity and should be considered in the differential diagnosis of every obscure cardiac disease. Webster and Cooke<sup>74</sup> readily produced myxedema in adult rabbits by total removal of the thyroid gland, and in the cases of more severe involvement this was accompanied by pericardial and peritoneal effusions; on microscopic examination the heart muscle showed marked degenerative changes.

7. *Hypertension*: Flaxman<sup>75</sup> studied the course of hypertensive heart disease in 623 uncomplicated cases, (189 known dead and 434 known living). Approximately 80% of the deceased succumbed within two years after the onset of symptoms. Congestive heart failure occurred most often within one year after the onset of symptoms, and 85% of the deceased had died within one year after the heart failure appeared. The majority of the deceased colored patients (65.2%) died before 50 years of age, while a minority of the deceased white patients (30.2%) succumbed before that age. 65% of the deceased died of congestive



heart failure, although all of the patients had evidence of heart failure at some time during the course of the disease or at the time of death. A significant number of patients, although very small in comparison with the remainder, had lived and are living 5 to 20 years after the appearance of the first cardiac symptom, and a lesser group had lived or are living 5 to 8 years after the occurrence of congestive heart failure. Averbuck<sup>76</sup> concluded that cardiac failure in hypertension is occasioned in the great majority of cases by coronary artery sclerosis and thrombosis which cause degenerative changes and eventual myocardial insufficiency or sudden death. In order to investigate the cause of heart failure in hypertension the hearts of 40 hypertensive patients who died with symptoms of myocardial insufficiency were studied; as a control group 30 hearts from patients with hypertension who died of cerebral accidents, renal insufficiency or incidental diseases, were likewise studied. 85% of the cases in the cardiac group had significant coronary arterial involvement whereas only 10% of the cases in the control group had significant coronary artery disease. White<sup>77</sup> noted the common occurrence of serious involvement of the heart in hypertension as 26% of his 1249 cases had angina pectoris, 8% had coronary thrombosis, and auricular fibrillation occurred in 171 cases, being paroxysmal in 55. Schulze and Schwab<sup>78</sup> called attention to the significant fact that, although arteriolar hypertension is practically unknown among the native African negroes, the disease is unusually prevalent in their descendants living in this country, the incidence being actually greater than that in the American white race; the importance of environment as a causative factor is emphasized. Andrus<sup>79</sup> studied the relation of age and hypertension to the structure of the small arteries and arterioles in skeletal muscle in 137 individuals from which he stated that it is not possible to distinguish between hypertensive and control patients by examination of the small arteries and arterioles of the pectoral muscle.

8. *Pulmonary*: Kountz, Alexander, and Prinzmetal,<sup>80</sup> from their observations on 17 autopsied cases of pulmonary emphysema and on dogs with experimental emphysema, stated that the heart is affected in the majority of patients with emphysema. The lesion, cardiac hypertrophy, with dilatation of the right ventricle when advanced,

may produce symptoms, but probably has no clinical reflection in its earlier stages. The cause of the left ventricular hypertrophy remains, as yet, undetermined, and there is experimental evidence to indicate that the right ventricular dilatation and hypertrophy occur chiefly in the earlier stages of emphysema, when the lungs are in the process of distention, rather than later as in the general opinion. Rubin<sup>81</sup> examined radiologically a number of cases of bronchial asthma with and without emphysema with a view to determining the size of the heart. He noted that the size of the heart is smaller in the majority of cases of bronchial asthma than the normal for age, height and weight of the patient; if the size of the heart in an asthmatic patient is normal for the individual's body proportions the heart is likely to be pathologically enlarged. Emphysema may give rise to many of the symptoms and signs of cardiac failure though the heart itself be normal, yet severe emphysema may exist for years without associated cardiac enlargement. When cardiac enlargement supervenes on an old-standing emphysema this enlargement is usually general and shared by both ventricles. In the absence of associated cardiovascular disease, a selective or preponderant enlargement of the right ventricle in emphysema is an uncommon finding.

9. *Coronary*: Kirshbaum,<sup>82</sup> from a statistical study of coronary disease at necropsy, reported that the incidence of severe coronary sclerosis in hypertrophy of the heart is not unusually high, as it occurred in only 155 (38.5%) of 403 cases considered the result of hypertension. Phipps<sup>83</sup> analyzed the contributory causes of coronary thrombosis and noted that 60% of 235 cases were in no way related to physical stress; in the remaining 40% exertion was, in 17% of the total, only moderate, such as walking or running a machine. More than half of these attacks during so-called exertion occurred within an hour after the ingestion of food. Campbell<sup>84</sup> studied the influence of gall-bladder and other infections on the incidence of coronary thrombosis and demonstrated that concurrent or previous infections are found in many cases, but it is difficult to prove that these infections are the determining cause of the severe cardiac lesion. Denny<sup>85</sup> attempts to explain the increase in coronary disease and its cause and states that little attention has been paid to the

fact that the disease is rare in men with occupations requiring daily physical effort and most frequent in those with sedentary occupations, which suggests that physical inactivity predisposes to coronary disease. Johnston,<sup>86</sup> from a study of the autopsy records of 400 patients above the age of 39 years, noted an incidence of marked coronary sclerosis of 24% for the white males, 9% for the colored males, 10% for the white females, and 4% for the colored females. Coronary occlusion, with myocardial infarction, either recent or old, was found in 9% of the white males, 4% of the colored males, 4% of the white females, and in 2% of the colored females. Levy and Boas<sup>87</sup> reported that among patients referred for cardiovascular diagnosis coronary artery disease was 4.9 times as frequent in man as in woman. All but 7.7% of 169 women with coronary artery disease had either arterial hypertension or diabetes mellitus. Mistaken diagnoses of coronary artery disease in women are common because of the erroneous interpretation of symptoms such as precordial pain with or without radiation to the left arm and a sense of choking and fear of death, symptoms that are common in the absence of organic heart disease. Gross and Oppenheimer<sup>88</sup> stated that coronary thrombosis is relatively rare in patients with rheumatic valvular disease, the most significant reason for the infrequent occurrence being that rheumatic fever runs its course before the degenerative period of heart disease. Root and Sharkey<sup>89</sup> reported that among 175 diabetic patients who were autopsied the most common cardiac lesion was coronary sclerosis and was present in some degree in 132 cases. The degree of coronary sclerosis bore a more definite relationship to the duration of the diabetes than it did to the age of the individual or the severity of the disease and this relationship held true for both the hypertensive and non-hypertensive diabetic patients. Coronary thrombosis occurred with approximately four times greater frequency in the diabetic patients with hypertension than it did in diabetic patients without hypertension. Edeiken and Wolferth<sup>90</sup> described briefly 14 cases with persistent pain in the shoulder region following myocardial infarction, the pain being usually described as burning, aching or wrenching, and occasionally shifting from shoulder to shoulder. It began coincidentally with the attack of coronary occlusion or any time up to at least four months after the

attack, and persisted from 7 weeks to over 5 years. Bruenn, Turner, and Levy<sup>91</sup> attempted to define some of the clinical and pathological features of coronary disease which are associated with cardiac pain and appear to favor its occurrence. Pain was present in 20% of cases of coronary sclerosis without occlusion and in 40% of cases with closure of a branch. The presence or absence of hypertension, in the group as a whole, had no effect on the incidence of pain. Levy and Bruenn<sup>92</sup> state that there is a group of patients with atherosclerosis of the coronary arteries to whom death comes suddenly and in whose coronary vessels, at necropsy, no fresh thrombus is found, and this syndrome may be designated "acute, fatal coronary insufficiency." In approximately 12% of their fatal cases of coronary sclerosis without thrombosis death occurred suddenly but if thrombosis had occurred death was sudden in 33%, so that the presence of thrombosis almost tripled the likelihood of sudden death. Thrombosis of a coronary artery is rarely if ever the immediate cause of death in these patients but it increases the liability to acute coronary insufficiency by further reducing the functional capacity of an already impaired coronary system. Schwartz<sup>93</sup> reported a study of 15 patients exhibiting the Adams-Stokes syndrome following acute coronary vessel closure. This group formed one-third of a series of 45 patients with the syndrome and in each instance there was evidence of antecedent hypertension. Cowan<sup>94</sup> reported 33 out of 43 patients alive more than six months after myocardial infarction, and concluded that the care taken at the time of the infarct and the reaction of the sufferer to his disability are two important factors in the prognosis. Willius,<sup>95</sup> from a study of 370 cases of coronary thrombosis, noted that in 71.9% the thrombosis occurred when the patients were between the ages of 50 and 70 years, with a great preponderance of males over females, 7.1. Solitary occlusion occurred in 80.3% of the cases; two episodes in 17%; three in 2.2%, and four occlusions in 0.5% of the cases. Death directly attributable to the heart occurred in 51.6%, and of these cardiac deaths 36.6% were due to coronary thrombosis, 51.9% to cardiac failure, and 11.5% to sudden death of uncertain mechanism. Gross and Schwartz<sup>96</sup> reported a case of an acquired interventricular septal defect secondary to coronary disease in a 57



year old male; this man, despite coronary artery and septal disease, lived six months, long enough to develop chronic congestive heart failure which for a considerable time was amenable to the usual diuretic measures. Feinberg<sup>97</sup> treated 6 patients with severe and intractable angina pectoris due to coronary disease, who were seriously incapacitated and had not improved on rest and customary therapy, with repeated intravenous injections of hypertonic saline solutions over long periods of time; definite and continuous improvement was noted in their clinical condition. Master, Jaffe, and Dack<sup>98</sup> studied the effect of a low calorie diet (800 calories) on basal metabolism in 28 patients with coronary thrombosis and in 14 with angina pectoris whose control readings were within normal limits; in 31 patients the reading was lowered 15 to 35%. No ill effects were noted from low metabolism induced by prolonged undernutrition of from 3 to 12 months duration. Collens, Stoliarsky, and Netzer<sup>99</sup> are not in accord with previous clinical reports which indicated that anginal symptoms are frequently aggravated in the insulin treated elderly diabetic with coronary sclerosis even when the blood-sugars are normal. They feel that harm has been done by introducing the concept that insulin has a deleterious effect on the heart of the elderly diabetic patient as it is not this but the hypoglycemic attack that is fraught with danger. Christensen,<sup>100</sup> in his remarks on sedimentation reaction in coronary thrombosis, finds the test of great diagnostic and prognostic value. A constantly increasing rate to high values is an unfavorable prognostic sign, while a slow and gradual decrease is a favorable sign. Shookoff, Douglas, and Rabinowitz<sup>101</sup> noted that the red cell sedimentation time is rapid in cases of acute cardiac infarction between the second and fifth days, and returns to normal between the 13th and 39th days; the rate may be abnormal when the temperature and leukocyte count are normal throughout. Hirsch<sup>102</sup> reported the case of a 71 year old male with a completely negative previous history with a severe attack of pain due to coronary occlusion unrelieved by the usual drugs and very cyanotic; phlebotomy gave no relief 4 cc. of Evipal was given intravenously and he fell asleep, after the first 2 cc. were given, for 15 minutes, awakening with only a dull precordial ache and made an uneventful recovery. Warner and Dauphinee<sup>103</sup> described a case of thrombophlebitis

migrans in a 45 year old male who had a complete occlusion of a coronary sinus by thrombus formation; the condition was diagnosed clinically because of repeated attacks of paroxysmal tachycardia in this patient with widespread migratory phlebitis. Polanco<sup>104</sup> analyzed the relation of coronary sclerosis to symptoms and its distribution in 242 fatal cases and noted that dyspnea and cardiac pain were the symptoms most frequently encountered; no cases with mild sclerosis gave a history of pain. Master, Jaffe, and Dack<sup>105</sup> reported a mortality rate of 16.5% in 267 attacks of coronary thrombosis, only 8% in first attacks; hypertension, which preceded the attack in 66% of cases, did not directly influence the prognosis. Sappington and Cook<sup>106</sup> noted radial artery changes in comparison with those of the coronary and other arteries from which they stated that the anatomic condition of the radial artery has no bearing on visceral sclerosis.

10. *Miscellaneous:* (a) *Pregnancy:* Jensen<sup>107</sup> stated there is no evidence that the age at death is less among parous women or that the period of survival after the first attack of rheumatic infection is shortened by pregnancy. The evil effect of pregnancy on heart disease seems to be that it may precipitate congestive heart failure when it is imminent and aggravate it when it is present. Of the various valvular lesions, the combination of mitral and aortic disease carries by far the highest death rate. The presence of auricular fibrillation in valvular heart disease increases greatly the chances of a fatal outcome, perhaps because it here indicates that the disease is approaching the end of its course. Donovan<sup>108</sup> stated that therapeutic abortion is indicated principally in cases of cardiac reinfection during pregnancy, in the few cases which are getting worse in spite of bed-rest and digitalis therapy, and in the more severe forms of aortic disease and congenital malformations of the heart. Henderson<sup>109</sup> stated that if cardiac failure in rheumatic heart disease does not occur during pregnancy, it is very unlikely to develop as the result of a normal labor. Bernstein<sup>110</sup> reported a successful delivery by Cesarean section in a 25 year patient with complete heart-block who had no signs of decompensation during pregnancy. Harvey<sup>111</sup> reported the occurrence of premature separation of the placenta and circulatory collapse associated with pericardial effusion in a 16 year old primipara who died on the operating

table while a Cesarean section was being performed; there were no changes in the heart itself.

(b) *Trauma*: Bigger<sup>112</sup> stated that in the diagnosis of heart wounds the history is of little value because the patient's observations under such circumstances are apt to be unreliable. The physical findings of cardiac tamponade, which vary with the degree of compression of the heart, are distention of the neck veins, distant and muffled heart sounds, circulatory collapse out of proportion to the amount of blood lost, pallor with cyanosis, and a relatively low pulse rate. The Watsons<sup>113</sup> used autohemotransfusion to combat the excessive loss of blood resulting from a stab wound of the heart in a 16 year old boy who had lost about 1400 cc. in the left pleural space and pericardial sac. Postoperatively the boy developed an empyema which necessitated aspirations and finally rib resection, but when examined seven months after the injury he was in good health. Mayer<sup>114</sup> treated seven cases of injuries to the heart and pericardium over a period of two years, five patients recovering. Two recovered without operation. No external drainage should be used following these major surgical procedures; instead a wide communication should be left between the pericardium and the pleural cavity to provide internal drainage, and if any considerable amount of fluid accumulates in the pleural cavity, it may be removed by thoracentesis. Kissane, Koons and Fidler<sup>115</sup> reported a case of rupture of the cusps of a normal aortic valve in a 22 year old male who was completely buried by stone and debris in an explosion and suffered multiple injuries to the arms, legs and chest. He lived 14 months after the accident and recovered from all the injuries, but died of congestive heart failure. Rixford<sup>116</sup> reported the case of a 40 year old dairyman who was kicked in the left lower chest and knocked unconscious by a cow. He worked for several days after the accident but was ill with pain in the chest and dyspnea. Pericardial aspiration yielded dark blood and x-ray revealed an enormous pericardial shadow. He expired 7 weeks after this aspiration while under ether anesthesia for pericardiotomy, but only the skin incision had been made. Bullock<sup>117</sup> reported the case of a 20 year old male who was shot in the heart and presumably dead when operated on for the experience; the patient recovered after surgery in spite of a complicat-

ing purulent pericarditis and left pleural empyema. If all patients with heart wounds dying in the ambulance or shortly after admission were sent not to the morgue but to the operating room and operated upon immediately, some of them would recover. Glendy and White<sup>118</sup> reported a case of nonpenetrating wound of the heart muscle with rupture of a papillary muscle and contusion of the left ventricular wall from external violence although there were no significant clinical findings suggesting cardiac trauma; death resulted 26 hours after the injury, from loss of blood, shock and an overwhelming pneumonic infection following the removal of a ruptured spleen. Spearman<sup>119</sup> reported the case of a 19 year old male who was shot in the left chest in 1932 and enjoyed good health for 20 months when he died of rupture of a traumatic aneurysm of the arch of the aorta into the esophagus. Williams<sup>120</sup> reported the case of an 18 year old male who was accidentally thrown from an auto and knocked unconscious; on recovering he complained of severe precordial pain and a marked tachycardia was present; 30 hours after the accident the pulse became bounding and the aortic closure sound became harsh; at 33 hours there were typical findings of aortic insufficiency. A pericardial friction rub appeared on the second and lasted to the seventh day, the heart sounds becoming normal on the eighth day.

(c) *Arteriovenous Aneurysm and Avitaminosis*: Walker<sup>121</sup> demonstrated reversible cardiac enlargement of enlarged hearts in arteriovenous aneurysm, beriberi and myxedema. These three diseases are readily amenable to specific treatment and should be considered either as primary or as contributing factors in the differential diagnosis of all enlarged hearts. Rabinowitz and Rogers<sup>122</sup> reported the case of a four year old boy who had a chronic avitaminosis with cardiac enlargement. All the symptoms and signs of heart disease disappeared after four months of adequate feeding.

(d) *Uterine Myoma*: Jacobs<sup>123</sup> reported from a critical analysis of his material that uterine myomas do not produce any significant changes in the cardiovascular system; no patient operated on for the myoma died of any cardiac complication despite the presence of coronary artery disease in several.

(e) *Nephritis*: Richter and O'Hare<sup>124</sup> described their clinical and pathological observa-



tions on the heart in 66 patients who came to autopsy with chronic glomerular nephritis. The heart in this disease is essentially the same as the heart in primary vascular hypertension except for the modifications brought about by the lower average age, the duration of the hypertensive process, the degree of hypertension, and by terminal uremic pericarditis.

#### 5. PATHOLOGY

1. *Myocardial*: Redfearn<sup>125</sup> reported a case of calcification of the myocardium which was so extensive it involved the entire anterior half of the left ventricle. This occurred in a 58 year old male with a history over a period of nine years, and at autopsy vascular channels were demonstrated in the pericardial adhesions. Bishop and Babey<sup>126</sup> emphasized the importance of keeping in mind the phenomenon of a massive left auricle to avoid mistaking this condition not only for effusions of the various types but also for malignant conditions of the mediastinum. Saphir<sup>127</sup> found meningococcus myocarditis twice among ten cases of meningococcus meningitis and carefully studied these for inflammatory changes in the heart muscle; in one case the patient developed signs of meningitis and died with marked cyanosis about 50 hours after the onset; the second patient, who also had typical symptoms of meningitis, had apparently improved when cyanosis developed and death occurred unexpectedly.

2. *Endocardial and Valvular*: Dana and Reidy<sup>128</sup> stated that 50% of all cases of rheumatic endocarditis of the mitral valve show no stenosis of this valve at autopsy, even in cases known to have been of many years' duration. Pure mitral stenosis is rarely found at autopsy and cannot be recognized with certainty even when present; modern physiologic study would seem to suggest that the clinical importance of mitral stenosis is at present too much emphasized. Marks<sup>129</sup> recorded a proved case of calcification in the annulus fibrosus, a figure-of-eight structure which surrounds both the mitral and tricuspid orifices (the degenerative process which leads to calcification has been noted only in the portion that surrounds the mitral orifice), in a 72 year old woman with cardiac symptoms of two years' duration. Sailer<sup>130</sup> reported a case of mitral stenosis with interauricular insufficiency. The prognosis simulates that of mitral disease, the average age at death being 35 years.

Blackford, Bryan, and Hollar<sup>131</sup> made a diagnosis of calcification of the aortic valve in a 37 year old colored man who had a long history of cardiac pain and a relatively short history of congestive heart failure; from the history and the postmortem microscopic findings the lesion appeared to be of rheumatic origin. This patient suffered with and from a classic angina pectoris. Gross and Friedberg<sup>132</sup> classified and described 47 cases of non-bacterial thrombotic endocarditis as an accidental occurrence in the course of any fatal disease and to be without clinical significance; its development is probably dependent on previous damage to the cardiac valves, almost invariably from an old rheumatic infection.

3. *Pericardial*: Blumer<sup>133</sup> stated that a localized and usually transitory pericarditis is clinically demonstrable in a certain proportion of patients with coronary occlusion, possibly in a third of them; occasionally much more widespread pericarditis is present which may involve the entire sac and eventually lead to its obliteration. Shipley<sup>134</sup> analyzed 12 cases of pyopericardium with 7 recoveries in which he used a low anterior approach and drained with two small tubes, placed with the finger, behind the heart and fastened to the skin margins to prevent displacement; irrigation may be a useful adjunct in these cases provided the fluid escapes from the pericardial sac as fast as it is introduced. Cohen, Fink, and Gray<sup>135</sup> reported the first case of sporadic *Salmonella suipestifer* bacteremia with acute pericarditis and pericardial effusion in a 36 year old female who had a pneumonitis and a pleural effusion also; recovery was uneventful and not associated with any sequelae. Heyl<sup>136</sup> cited the case of an 18 month old boy operated on for an acute suppurative pericarditis, the youngest survivor. Pick's disease is not to be anticipated as a sequela of surgical drainage of the pericardium. Griswald<sup>137</sup> reported that in a 17 year old patient with chronic cardiac compression caused by a scar, complete relief was obtained by resection of the constriction. The drainage of the large amount of fluid which forms about the heart after this and other cardiac operations is a serious problem, as the absorptive qualities of the mediastinal tissues are uncertain, and enough fluid may collect within a few hours to produce serious compression of the heart. Leaving a drainage tract to the surface of the skin carries with it a real hazard of

infection, and the most satisfactory way out of the dilemma is to leave a generous opening for drainage into one of the pleuræ so that during the postoperative period the effusion may be removed from the pleura by thoracentesis. Mayer<sup>138</sup> recorded the case of a 38 year old female with acute endocarditis of the aortic valve and old rheumatic aortic and mitral stenosis who developed a fibrinous pericarditis with effusion and died of uremia, a rare complication of this infection. Wright<sup>139</sup> reported the case of a 25 year old male who had two blows over the anterior chest wall 8 years previous; because of persistent pain in the chest an x-ray was taken which revealed an extraordinary shadow; a calcified cyst of the pericardium was removed surgically and the patient made an uneventful recovery. Sprague<sup>140</sup> stated that acute and chronic constrictive pericarditis cause signs and symptoms suggestive of cardiac insufficiency but should not be mistaken for this, since paracentesis or the surgical relief of the chronic condition may result in complete disappearance of the patient's disability.

4. *Vascular*: Osgood, Gourley, and Baker<sup>141</sup> stated that dissecting aneurysm of the aorta is characterized clinically by the sudden onset in a patient with hypertension, of severe, tearing pain in the chest, usually radiating to the back, followed, after a variable interval of time, by sudden death. It is characterized, pathologically, by a primary rupture of the intima with a splitting of the media, and a second rupture externally or, less commonly back into the lumen. Elliot and Evans<sup>142</sup> reported the rupture of an aneurysm of the abdominal aorta in a 59 year old male with hypertensive heart disease. The clinical picture strongly suggested shock following coronary occlusion and the electrocardiographic changes which were characteristic of and before death were diagnosed as those of coronary occlusion, were seen in retrospect to have been probably due to a relative ischemia of the myocardium without infarction. Peery<sup>143</sup> reported a case of dissecting aneurysm of the aorta with recovery from the actual dissection and survival for 15½ months in a 52 year old colored female with marked hypertension of known 6 years' duration. Cardiac hypertrophy increased very rapidly after the dissection, although the hypertension had already been present for at least 6 years, and symptoms of decompensation were not ap-

parent until after the dissection had occurred. This was thought to be the result of the loss of elasticity of the aorta by virtue of the presence of the new channel, thus throwing the whole burden of propulsion of the blood on the heart alone. Kampmeier,<sup>144</sup> from a study of 73 cases of aneurysm of the abdominal aorta, stated that the prognosis in this lesion is poor, the majority of patients dying within six months from the onset of symptoms, death usually occurring suddenly and due to rupture of the aneurysm. Furrer<sup>145</sup> noted rupture of the aorta as the cause of sudden death in three cases, all aged females with atheromatous aortæ and unaccompanied by spirochætal cardiovascular changes.

## 6. FUNCTIONAL DISORDERS

1. *Congestive Failure*, including use of *Digitalis and Diuretics*: Harrison<sup>146</sup> stated that the forward type of circulatory failure usually involves primarily the peripheral vascular apparatus but is occasionally due to disorders of the heart; the clinical picture is that of collapse and is brought about by inadequacy of the tissue blood supply. The backward type of circulatory failure is dependent on chronic disease of the heart, which leads to a rise of venous pressure either in the pulmonary or systemic vascular bed, or in both of these areas, and produces the clinical picture of congestive heart failure. Warfield<sup>147</sup> emphasized that it is not the heart that fails in acute infections; the peripheral circulation collapses, so that the heart has no blood to pump; the heart usually becomes smaller in acute infections until just before death, when it dilates because of anoxemia. Digitalis is not a useful drug in these cases of peripheral circulatory failure. Harrison<sup>148</sup> expounded the principles of therapy in patients with congestive heart failure as the successful prevention and treatment of the precipitating factors of heart failure, obtaining rest of the heart, and rigid treatment of some of the effects of heart failure to help the underlying functional disorder which produces the heart failure. Clarke<sup>149</sup> stated that the main points in deciding the need for treatment after compensation returns are a regular pulse rate above 80, auricular fibrillation with a large pulse deficit and increased venous pressure. Bower and Mengle<sup>150</sup> reported the occurrence of two deaths postoperatively following the combination of the intramuscular administration of digitalis



and intravenous injection of calcium chloride or gluconate. Berliner<sup>151</sup> reported that the intravenous injection of 10cc. of a 20% calcium gluconate solution produced changes in the electrocardiograms, flattening or inversion of the T-waves in 92% and a marked bradycardia in 67%, of 26 normal individuals. Geill<sup>152</sup> indicated that coronary disturbances and their complications present the main field for the use of theophylline with ethylene diamine; in a case of coronary thrombosis with violent precordial pain, in which large doses of morphine were ineffective, the pain was relieved by the intravenous injections of this drug. Alstead<sup>153</sup> stated that chloral hydrate in therapeutic dose has no harmful effect upon the heart; when the blood pressure is lowered during the administration of this drug the effect is not much greater than occurs in normal sleep. Hayman<sup>154</sup> emphasized that diuretics have their greatest usefulness in congestive heart failure after the patient has been digitalized. Levin<sup>155</sup> stated that the treatment of cardiac dyspnea should include the prompt use of mercurial diuretics when rest and digitalis fail to give relief. Wood<sup>156</sup> is of the opinion that the xanthine diuretics should be tried after digitalization and before turning to the mercurial drugs; the xanthines act better in patients with hypertensive and arteriosclerotic heart disease than in rheumatic heart disease. This does not imply that the diuretic drugs should be used as a last resort, as edema may increase cardiac work and impair cardiac insufficiency. DeGraff, Nadler, and Batterman<sup>157</sup> treated 20 patients under controlled conditions with mercupurin to note the diuretic effect of this drug; they concluded that the diuretic effect of mercupurin is greater than that of a mercurial diuretic not containing theophyllin, and its superiority is chiefly if not entirely due to the presence of theophyllin. Parkinson and Thomson<sup>158</sup> described a mercurial suppository containing  $\frac{1}{2}$  grain of novurit combined with 5% theophyllin in cocoa butter as diuretic for cardiac edema. In ten cases of congestive heart failure so treated the average 24 hour excretion of urine per dose of suppository was 2470cc., as compared with 3435cc. for novurit and 2600cc. for salyrgan, both intravenously. No toxic or irritative effects of the suppositories occurred. Fulton<sup>159</sup> described mercurin suppositories containing 500 milligrams of the mercurial salt of mercupurin which caused diuresis in

edematous patients comparable with those observed after the intravenous injection of mercurial salts. Each mercurin suppository has a cocoa butter base without any added theophyllin, the mercurial salt being present in approximately five times the amount of mercury contained in 1cc. of mercupurin or salyrgan. No significant or untoward toxic effects were noted in 25 patients receiving 1 to 15 suppositories. Budnitz<sup>160</sup> stated that in his patients the use of the mercurin suppositories caused severe burning, irritation and tenesmus of the rectum. He coated the suppositories with nupercainal ointment, and there was complete elimination of the local discomfort and no perceptible loss in diuretic action. Proger and Magendantz<sup>161</sup> presented evidence of the beneficial effects of rigid dietary restriction on the state of the circulation in patients with heart failure; these effects were of about the same magnitude and in the same direction as those obtained by digitalis. The restriction is such as to effect a loss of about 10% of body weight over a period of 2 to 4 weeks, exclusive of edema fluid, and the beneficial effects persist so long as the lower weight level is maintained. Baker and Bloom<sup>162</sup> stated that verodigen, a digitalis glucoside, exerts the same qualitative therapeutic effects as digitalis and provokes the same symptoms when given in overdoses.

2. *Angina Pectoris*: Jervell<sup>163</sup> stated that in the anginal pain of cardiac infarction the basis is an absolute coronary insufficiency in a limited field, corresponding to acute coronary stenosis; in effort angina it is a relative coronary insufficiency manifested only under special conditions, as in physical exertion. In cases of coronary sclerosis the decisive factor is not the extent of the sclerosis but the extent to which it causes stenosis in one of the main branches of the coronary arteries, leading to a disproportion of the blood supply. Riseman<sup>164</sup> studied the relation of the systolic blood pressure and the heart rate to attacks of angina pectoris precipitated by effort and noted a wide variation in these at the onset of the attacks; he considered such changes in the blood pressure and pulse rate as not being the primary etiologic factors in the precipitation of the attacks of angina and of no value in the diagnosis. Bisgard<sup>165</sup> reported the case of a 67 year old farmer with angina pectoris of 2 years' duration and a non-toxic adenoma of the thyroid of 20 years' duration. Total ablation of the left

lobe and subtotal removal of the right lobe, because of a low basal metabolic rate that was present before surgery, was performed. Immediately after the operation and to date, 11 months, the pain disappeared and the patient engaged in light farm work.

3. *Arrhythmias, Etc.*: (a) *Paroxysmal Tachycardia, Etc.*: Starr<sup>166</sup> reported further studies on the action of acetyl-B-methycholin in the treatment of 75 attacks of paroxysmal tachycardia in 37 patients; in 66 instances the attack was promptly brought to an end. Thompson and Levine<sup>167</sup> analyzed certain factors influencing the prognosis of pulsus alternans in 71 patients; the average duration of life after the detection of the alternation was  $14\frac{1}{2}$  months and the younger the patient, the worse the prognosis. Rubell and Strauss<sup>168</sup> reported the sudden death of a child suffering from paroxysmal ventricular tachycardia; the definite pathologic changes found in the conduction system were considered the result rather than the cause of the tachycardia. Gilchrist and Millar<sup>169</sup> described the occurrence of paroxysmal auricular tachycardia in a 57 year old male who also had extreme dyspnea, submammary pain and congestive heart failure; at autopsy a large myxomatous tumor springing from the left side of the interauricular septum was found. Pal<sup>170</sup> stated that the origin of extrasystoles are not uniform but toxic, psychic, and other factors may play a part, especially occurring intermittently in persons without heart disease where medicaments for the heart are unnecessary. Boas and Levy<sup>171</sup> emphasized that extrasystoles may offer valuable evidence of myocardial damage or strain and their discovery should always lead to a careful cardiovascular examination and an attempt to determine their cause. Multifocal extrasystoles are usually accompanied by serious myocardial disease; numerous extrasystoles occurring in patients with coronary artery sclerosis usually indicates a progressive vascular lesion. Extrasystoles occurring at heart rates above 110 are usually indicative of myocardial disease. Bramwell<sup>172</sup> reported that in his consecutive series of 1353 cardiac cases seen during a three year period, he noted the presence of presystolic gallop rhythm in 63 patients, of which 55 are now dead. Only 15 of the 63 patients lived more than 18 months after the condition was noted. Thompson and Levine<sup>173</sup> reported that the average duration of

life in 89 patients after the detection of diastolic gallop rhythm was approximately 11 months; in patients under 40 years of age it had a very ominous significance. Evans<sup>174</sup> reported a case of ventricular standstill in a 54 year old male with syphilitic aortitis, associated with nodal rhythm and preceded by anginal pain; at autopsy the coronary ostia were found to be involved. Weiss and McGuire<sup>175</sup> described ectopic auricular tachycardia of many years' duration in two patients, neither of which had any evidence of cardiac hypertrophy or myocardial insufficiency. Evidently cardiac rates of 150 or below are not dangerous in themselves, even when existing for years, in the presence of an otherwise normal heart.

(b) *Auricular Fibrillation and Flutter*: Luten and Jeffreys<sup>176</sup> emphasized that it is no more correct to administer digitalis regularly on all occasions of fibrillation than it is to perform thyroidectomy, although each procedure is helpful in appropriate cases; it is not the sign but the disease that produces the fibrillation that treatment should be directed. Luten,<sup>177</sup> in discussing the relationship of tachycardia to cardiac insufficiency, stated that in auricular fibrillation the ventricular rate appears to depend largely upon the state of the ventricular muscle. In cases of fibrillation without heart failure the muscular effect of digitalis is not beneficial and in such instances the administration of the drug is not followed by slowing. Evans<sup>178</sup> reported the study of a group of 39 patients with organic heart disease who were known to have had auricular fibrillation for long periods of time ranging from 8 to 18 years; of these cases there were 22 with rheumatic valvular and 17 with non-valvular heart disease. The majority of patients had enlarged hearts, some to an extreme degree, at the onset of fibrillation, and almost half had objective manifestations of congestive failure when first seen. It is believed that these patients owe their longevity in large part to their good fortune in escaping or surviving the accidents to which patients with cardiac disease in general are subject, namely, embolism, bacterial endocarditis, cerebral hemorrhage and coronary thrombosis. Orgain, Wolff, and White<sup>179</sup> noted that paroxysms of auricular fibrillation and flutter occur not infrequently in persons with no other signs of heart disease. A follow-up study of 54 such patients revealed a low mortality rate,



little important cardiac disease and but a single instance of hyperthyroidism after a lapse of a significant number of years. The Bishops<sup>180</sup> reported their observations on the clinical course of arteriosclerotic auricular fibrillation in 69 patients, of which 12 females lived 5 to 20 years after the onset of the fibrillation. The fact was noted that, for some reason or other, if these patients lived more than five years with the fibrillation, they seemed to live a considerable time longer. Tung<sup>181</sup> reported that in 15 patients, 2 without and 13 with congestive heart failure, full digitalization caused the appearance of auricular fibrillation with other signs of digitalis intoxication. The abnormal rhythm in all cases disappeared several days after the digitalis was discontinued. Rykert and Hepburn<sup>182</sup> gave a uniform dose of strophanthin, gr. 1/100, intravenously over 200 times to 33 patients, of whom 29 had auricular fibrillation. They recommend strophanthin as a convenient, effective, cheap and safe drug for intravenous use when rapid reduction of the heart rate is desired or when vomiting or marked passive congestion renders the use of the alimentary tract doubtful, but it should not be used when digitalis has been taken recently.

(c) *Quinidin Therapy*: Campbell and Gordon<sup>183</sup> restored normal rhythm with quinidin sulphate therapy in 64% of 135 cases of auricular fibrillation; in 34% it was still maintained after an average period of 4 years; in 30% it was restored but fibrillation occurred after an average period of two years; 25% still maintain normal rhythm after 9 years. Quinidin has an important place in the treatment of auricular fibrillation provided the cases are carefully selected and satisfactory results are obtained by paying attention to three main criteria: the absence of congestive heart failure, or of a greatly enlarged heart, or of a long history of fibrillation. The case of fibrillation is suitable for this treatment if there are no signs of failure, if the heart is not enlarged beyond 13cm. transverse diameter, and if the fibrillation has been established less than one month. It is not suitable if there has been congestive failure or if any signs of failure persist after treatment with bed rest and digitalis or if the fibrillation has been present for six months. Parkinson<sup>184</sup> stated that when a patient is seen shortly after the onset of auricular fibrillation and it is the only sign found, it is our duty to stop this arrhythmia by quinidin

(possible, as a rule), not only to prevent the ensuing enlargement but also to avoid the consequent formation of intracardiac thrombi. Gethner<sup>185</sup> is of a different opinion, as he feels that the contraindications to the use of quinidin are numerous, while the indications are few in the treatment of auricular fibrillation to restore normal rhythm. Kerkof<sup>186</sup> determined the minute volume of the heart in mitral stenosis during auricular fibrillation and after the restoration of normal rhythm. His results show that the minute volume is frequently reduced and the appearance of the fibrillation further reduces this by 22%. The restoration of normal rhythm by the use of quinidin is of definite value in that it increases the minute volume by about 25%, and this increase in cardiac efficiency justifies the use of quinidin.

(d) *Heart-Block*: O'Farrell<sup>187</sup> expressed the opinion that the correct interpretation of the electrocardiogram for localizing the lesion in bundle-branch block in man cannot as yet be considered settled. It is doubtful from the clinical viewpoint if anything is to be gained by defining localized lesions of the bundle with minute exactitude. Tung<sup>188</sup> demonstrated that aberrant ventricular complexes of the type generally recognized as bundle-branch block may occur in healthy individuals without heart disease. Sampson and Nagle<sup>189</sup> reviewed 157 cases of classical bundle-branch block and 112 cases of heterogeneous atypical intraventricular conduction defects; in the first group the patients with successive records showing no change had a lower fatality than patients whose electrocardiograms showed either advances or recessions from the extreme form of bundle branch block. Kurtz<sup>190</sup> presented six cases of transient bundle-branch block, three of which had one or more recurrences; all of the patients were above 54 years of age and in every instance organic heart disease was demonstrable, the etiology being coronary disease, hypertension, or a combination of the two. Graybiel and White<sup>191</sup> analyzed briefly 72 cases of complete auriculoventricular dissociation and noted the association of coronary artery disease in 47 of the patients; the heart disease responsible for the block in these cases affected the clinical course, treatment and prognosis far more than did the block itself. Steuer<sup>192</sup> reported the case of a 39 year old female with complete heart-block and a basal metabolic rate of plus

36% which dropped to a plus 3% on Lugol's solution before surgery; the block disappeared under iodine therapy and did not recur after the removal of the adenomatous thyroid. Schwartz<sup>103</sup> correlated the clinical and electrocardiographic manifestations in 6 patients with A-V dissociation who exhibited recurrent syncopal attacks due to transient ventricular fibrillation; in each instance it was determined that the alterations in the rhythm of the heart preceding a period of ventricular fibrillation were characterized by an acceleration of the basic ventricular rate of the ventricles. Kremer and LaPlace<sup>104</sup> described the case of a 25 year old female in whom transient heart-block with Adams-Stokes syndrome occurred following x-ray therapy for toxic goiter, and called attention to the clinical value of recognizing heart-block as a possible cause of bradycardia in the presence of hyperthyroidism. Yater, Cornell and Claytor<sup>105</sup> reported three cases of A-V heart block due to bilateral bundle-branch lesions with detailed histopathological studies and considered the pathogenesis to be coronary artery disease in all.

#### 7. SPECIAL TREATMENT

*Total Ablation of the Normal Thyroid Gland:* Bourne,<sup>196</sup> in discussing the choice of patients with angina of effort for total thyroidectomy stated that it is impossible in some cases to deduce the state of the myocardium from the clinical examination of the heart alone; in most patients with angina of effort there are periods of comparative freedom from symptoms, so that attention should be directed upon these periods. McCreery<sup>197</sup> reported the results of this procedure in a case of congestive heart failure that was improved ten months later and required much less hospitalization; and in a severe angina of 6 years' duration the patient was entirely free of pain and enabled to return to a relatively normal life. Clark, Means, and Sprague<sup>198</sup> related their experience with total thyroidectomy in 21 patients with congestive failure and of which 15 were dead at the time of the report; they blame their relatively poor results to a great degree upon the difficulty in the selection of cases. Pettis and Sorsky<sup>199</sup> stated they could only select five cases out of 150 patients suffering from heart disease for this operation, which emphasizes the extreme limitations of this new procedure. Rise-man<sup>200</sup> is of the opinion that the operation con-

fers benefit on a group of cardiac patients who have not been helped by any other method known at the present time; the operation is not applicable to all but a carefully selected group of patients.

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## TRUE VAGINAL HERNIA: REPORT OF A CASE

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A true hernia is the protrusion of a loop or knuckle of an organ or tissue through an abnormal opening. The incidence of real herniation of abdominal organs, with a sac, its neck and contents, is extremely rare in the vagina, when one considers the possibility of such an occurrence from the standpoint of apparent anatomical weakness plus trauma during parturi-

tion or intra-abdominal pressure of ascites or tumor formation.

These true herniations are not to be confused with false herniations, such as cystoceles, rectoceles and procidentiae. The latter are differentiated in that they have no peritoneal sac with a well defined neck. To mistake a posterior vaginal hernia for a rectocele and repair accordingly will be productive only of disappointment to both surgeon and patient.

*Literature.* Vaginal hernia as an entity was first reported by Garengéot in 1736, as quoted by Young.<sup>1</sup> From then until 1804 several incomplete and unverified descriptions were given. In 1804 Cooper<sup>2</sup> detailed a case which he found postmortem. During the following eighty years unquestionable cases were reported only twice, first by Taylor<sup>3</sup> in 1831 and then by Barker<sup>2</sup> in 1876. Thomas,<sup>4</sup> in 1885, reported the first case of true vaginal hernia operated upon and described the possible locations of the hernial sac.

Miles,<sup>5</sup> in 1926, gave a most comprehensive review of the literature, detailed nine previously reported undoubted cases and added two of his own. He discussed the pathological anatomy, etiology, diagnosis and treatment of true vaginal herniae. He presented also a classification of pelvic herniae which is most complete and which is generally accepted today. He is deserving of lasting praise for a markedly succinct account of these conditions.

Masson and Simon,<sup>6</sup> in 1928, reported five cases operated on and discussed surgical repair. and Masson<sup>7</sup> added to the report in 1932. Since then cases have been reported by Green and Buzzelle,<sup>8</sup> Bueermann,<sup>9</sup> Black<sup>10</sup> and Stearns.<sup>11</sup>

*Classification.* Vaginal hernia is a subdivision of pelvic herniae and in turn is divided into two classes according to its origin. These are first, the posterior vaginal hernia which originates in the pouch of Douglas and dissects its way between the posterior vaginal mucosa and the rectum, presenting posteriorly in the vagina, and secondly, the anterior vaginal hernia which originates between the bladder and anterior aspect of the uterus, presenting along the anterior vaginal wall. It is, however, not impossible for a hernia to originate lateral to the uterus. The posterior variety is, for obvious reasons, by far the most common.

**CASE REPORT:** Mrs. A. G., aged 46 years, a widow, was first seen by us on November 6, 1936, com-

plaining of a constant headache and backache and "falling of the womb." Symptoms had been present for twenty years. The mass in the vagina had been present since the birth of her only child twenty years ago. The child weighed six and three-fourth pounds and the delivery was difficult. In 1919 the patient was operated upon for rectocele with no relief, and in 1931 was operated upon for procidentia, a uterine suspension and vaginal repair being done. (Had the posterior cul-de-sac been explored at this time the hernia would have been discovered.) The patient stated that this operation relieved the vaginal mass for two weeks, after which it recurred larger than before. (A rectocele repair could possibly retain the hernia temporarily.) Her history was otherwise irrelevant.

Examination showed a fairly well developed white female of 46 years. Blood pressure was 140/70, temperature normal, red and white blood counts within normal limits, Kahn and Wassermann tests negative and urine showing nothing abnormal. The general physical examination was essentially negative.

Vaginal examination showed a large mass presenting from the posterior vagina, enlarging when the patient strained, having a definite cough impulse and being entirely reducible. No cystocele or rectocele accompanied nor did the uterus seem to move with the mass.

A diagnosis of posterior vaginal hernia was made and the patient operated upon by the combined route on November 14, 1936, at Ravenswood Hospital. The neck of the hernia was between the uterosacral ligaments. The hernial contents were removed from the sac and the neck obliterated by closing the pouch of Douglas. The right tube and ovary had previously been removed and a shortening of the round ligaments had been done. The abdomen was then closed and the hernia sac dissected from below and removed. A high perineorrhaphy was done. Convalescence was rapid and there has been no recurrence to date (five months). All symptoms have disappeared.

*Etiology.* The three factors of etiological importance in the production of true vaginal herniae are intra-abdominal pressure, predisposition of weakness of the perineal floor and trauma. The main intra-abdominal agents are pregnancy, ascites and tumor. The pelvic floor may suffer from accidents of parturition or inherent perineal weakness. Trauma may well include both delivery of children and straining at more-than-ordinary household duties, such as heavy lifting, etc.

*Symptoms.* The patient presents herself with the complaint of a mass in the vagina or protruding from the vagina. This mass is soft to the touch, larger when the patient is in the erect position, and reduces in size or disappears when she reclines. She describes it always as "a dropping of the womb." Dragging abdomi-



nal pains may accompany, as may bladder or rectal distress.

Examination shows an anterior or posterior vaginal mass, dependent upon the type of herniation, soft to the touch, reducible, enlarging when the patient "bears down," and having a definite cough impulse. This cough impulse, together with the complete reducibility of the mass, serves to distinguish vaginal hernia from cystcele, rectcele, uterine prolapse and vaginal cysts. The latter conditions may very well accompany the hernia and every vaginal examination should include the cough impulse and reducibility tests.

*Treatment.* General principles of treatment are those of all herniae, namely, evacuation of the contents of the sac, high ligation at its neck and removal, followed by repair of split tissues. Moschowitz<sup>12</sup> outlined the technic of repair of vaginal herniae which is now generally followed. This consists of an intra-abdominal evacuation of the contents of the sac, closure of the neck by a purse-string about the sac of Douglas or the vesico-uterine space (as the case may be posterior or anterior), removal of the sac by the vaginal route and repair of the dissected septum of the vagina.

An alternate procedure is begun from below, dissecting out the sac and inverting it into the pelvis, repairing the pelvic floor, then entering the abdomen and removing the sac or utilizing it to fill the defect at the neck of the hernia.

In our case the vaginal route first would have made for easier dissection, because the hernial contents would make facile separation of the sac from scar tissue secondary to the two previous repairs. However, aseptic technic should be observed whenever possible and the abdominal repair made before the probable contamination of the operator by the perineal procedure.

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#### CRYPTITIS

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Cryptitis is an inflammation of the crypts of Morgagni. In order to understand the pathology of cryptitis it is necessary to review some of the anatomy of this part of the rectum.

The mucous membrane of the lower part of the rectal ampulla is thrown into longitudinal folds as the lumen of the bowel narrows to the constricted anal canal. This folding of the mucosa permits snug closure of the anus when the sphincters are contracted, and also accommodates itself to full dilatation without injurious stretching, when the anus is opened for the passage of feces or for instrumentation. Between each two folds there is a depression of the mucosa, the lower end of which terminates in a cup-shaped pocket, known as an anal pocket or crypt of Morgagni. Some of these crypts are but slight depressions, while others form distinct sinuses.

The mucosa at the lower end of this interfold depression is loosely puckered into a semilunar fold, which very much resembles the semilunar valve of the heart, and is often referred to as an anal valve. This area, known as the anorectal line, linea dentata, pectinate line or the white line of Hilton, is of special interest because it is the seat of inflammatory changes which produce symptoms apparently out of all proportion to the lesion.

*Pathology:* The function of the crypts of Morgagni is not fully understood. It is thought that they collect or secrete mucus, presumably to lubricate the anal canal during the act of defecation, the mucus being expressed from the crypts by the pressure of the feces thus lubricating the muco-integumentary portion of the canal which has no mucosa to lubricate itself. The fecal mass, at this juncture, has to overcome the contraction of the external sphincter muscle; hence, the necessity of some sort of lubrication at this part of the canal. Since the function of these crypts is so essential, it is important to be able to recognize a healthy crypt from a diseased one. Otherwise, great injury may be done to the

function of defecation by removing healthy crypts.

The crypt's mouths, being directed upwards, it is very easy for substances coming down through the canal to lodge in the crypts and irritate them. It may be hardened feces, fecoliths, seeds, needles, pins or any hard substances with sufficiently small a point to lodge in the crypt. Frequently cryptitis is an extension of a proctocolitis or the mouth of an internal fistula opening into the crypt.

When hardened feces become lodged in a crypt, the tendency is to collect additional feces, until the pressure becomes so great that irritation is set up, finally resulting in pressure necrosis and thus exciting a cryptitis that may become chronic; or a persistent ulceration may result, that, if left untreated, may cause a fissure or go on to abscess and a final fistula.

If the pressure is not sufficient to cause necrosis and ulceration, the irritating mucus secreted may burrow down subcutaneously, forming a sinus with a large skin tab externally. If the irritating mucus passes out at the mucocutaneous border, an excoriation will result. Also the inflammation of the crypt will cause hypertrophy of the neighboring papilla, the composite irritation later causing spasticity of the external sphincter and sphincteralgia. The pathologic changes are often of a low grade and cryptitis has been looked upon by some as a neurosis being referred to at times as "an insane rectum."

*Symptoms:* The symptoms of cryptitis are not pathognomonic, but may be produced by any inflammatory disease of the anal canal.

A constant, dull, aching pain in the anus or rectum is the chief symptom, being accompanied usually with a feeling of heaviness. The pain is increased during defecation, following strenuous exercise or prolonged standing, and is relieved by sitting or by pressure on the perineum. If abscess threatens, the pain becomes so intense that the condition may be mistaken for anal fissure or neuralgia of the rectum.

A low-grade, chronic inflammation may involve all the tissues of the anal canal and the aching pains may radiate to the sacrum, down the legs (resembling sciatica), or may simulate sacrococcygeal neuralgia.

Reflex pain and spasm of the neck of the bladder may cause prostatic irritation, frequent micturition or urinary retention, and thus prostatic

disease is erroneously diagnosed, or, in the female, dysmenorrhea or amenorrhea may throw suspicion on the generative organs.

If the inflammation were confined to the mucous coat of the bowel, there would be comparatively little trouble in eradicating it but, unfortunately, the infection often involves the areolar and muscular coats and even extends to the perirectal tissues. In this manner, not only are sacks or ulcerating pouches formed, but sinuses burrow various distances up the bowel or outward under the perianal skin, causing an itching, not relieved by scratching, though not a true pruritus. These septic foci constitute a frequently overlooked cause of pruritus ani. As the mucopus is imprisoned in these sinuses, the overlying structures, mucosa and skin, become puffy and more or less sensitive. If the accumulated excretion is confined beneath a thin layer of tissue, it is easily recognized during the examination. When fecoliths or other foreign substances become lodged in a crypt, they may cause excessive itching or pain, until removed by the passage of feces or otherwise.

Pain in some form (usually sphincteralgia) is the most frequent cause for which patients apply for treatment. Inflammation and edema of the mucosa cause contraction of the sphincter, and the spasm of the sphincter increases the pain. A burning, stinging pain is usually due to hypersecretion of mucus. If a complete fistula exists, the irritating discharge will cause an excoriation of the mucosa and the anal skin. Sometimes, if the discharge is excessive, the anal margins may be glued together.

*Diagnosis:* With a history of the above symptoms, cryptitis should be suspected and a careful examination made. With a fenestrated conical speculum in the rectum, the window is slowly rotated and each crypt or pouch fully exposed and carefully explored for the lodgement of foreign bodies or ulcerations. With a fine straight probe, every crevice or depression in an upward direction is explored, while a bent probe searches all recesses extending downward. The probe should be of silver, very fine, and should offer no resistance to the tissue. It should be remembered that a probe may easily be introduced into the crypt and through its walls into healthy tissue beyond.

If a crypt is inflamed or a channel discovered, the introduction of the probe will occasion severe



pain and the patient will flinch and cry out. It is therefore necessary to minimize this suffering by applying a pledget of cotton soaked in a 10% solution of cocaine. Local anesthesia should be resorted to only in extremely nervous patients, as the anesthesia will obscure the condition of the crypts. The probe, introduced into a healthy crypt causes very little pain, if any; while, in an inflamed crypt, the pain is very excessive. This is often the only criterion of a deviation from the normal. So it is easy to see how anesthesia may cause the examiner to overlook a mild or beginning cryptitis, by obscuring the evidence—pain on probing. If there is much sphincteralgia, the sphincter must be desensitized. This can be done with a 0.5% solution of novacaine.

During our search it will usually be necessary to examine the patient in different positions; first, perhaps, having him lie on his left side and later on his right or in the knee-shoulder position. Sometimes only a small spot of abnormal discoloration will be noticed; or, again, there is abundant evidence of inflammation. The patient may be able to assist in locating these areas by directing attention to those parts which are most tender or sore, and which are usually referred to as giving a sensation of heat. The discoloration of these spots is usually reddish-brown or brown. If there are no special points of tenderness, the areas of most intense itching will serve as a guide to the underlying retention pockets.

*Treatment:* Beginning or mild cases of cryptitis can be cured by making topical applications through a slanting anoscope. The feces must be kept soft and each diseased crypt thoroughly cleansed, by flushing with water, before any medicament is applied. A syringe with a straight or angulated nozzle is essential to get to the bottom of the crypt. Dental syringes act very well.

After the crypt has been flushed clean, it may be bathed with 2% solution of Mercurochrome, or for more active stimulation, a probe is dipped into pure ichthyol and passed in through the speculum until the crypt is reached. With great care the probe containing the ichthyol is then passed into the crypt and in this manner the ichthyol is applied directly to the ulcerated area. This process is continued daily until all pain has disappeared, and this can best be demonstrated

by passing an ordinary probe, bent as described, and thus testing the crypt.

If there is much destruction of tissue and a burrowing process is much advanced, it will only be a waste of time to make topical applications. A cryptectomy should be done at once. I do not advocate the splitting operation, because the cut surfaces may reunite and the operation prove a failure, or else, ugly flaps may remain, causing a continual source of annoyance. The entire valve must be removed and the pocket completely obliterated. This may be done by slipping a blunt hook into the crypt or channel, lifting the tissue toward midline of lumen of anal canal, and with scissors, clipping off a triangular section, base upward, which represents the median wall or "roof" of the crypt, transforming the crypt into an open groove. If there are any sinuses leading down from the diseased crypts, they should be excised. It is not necessary to put the patient to bed after an operation of this kind, as the maneuver causes very little inconvenience, only a slight soreness for a few days, though usually, a fortnight is required for the parts to heal completely. No general anesthesia is necessary. Local anesthesia acts excellently. Care must be exercised not to overdilate the tissues, as the operator's landmarks will be obliterated.

If the sinus extends down into an external skin tab, this should be removed. Sometimes a sinus will extend a considerable distance out under the skin, and at some point in the raphe, either anterior or posterior, will be found the site of most intense itching, burning or pain, from which branch channels may lead to distant points.

The exquisitely tender or sensitive points are frequently the external evidence overlying seromucous sacculations and are vantage points for opening the subcutaneous channels. Such an area may be completely blocked off with 0.5% novocaine solution and opened down to the fatty tissues. Quite a large cavity may be found, filled with broken-down, blood-stained or brownish-colored tissue. This tissue must all be removed with a curette and a search made for channels leading from this cavity, and it is often surprising to find the probe slip along a considerable channel.

Other channels may be found, extending out on the buttocks, sometimes encircling the anus

or extending widely to the scrotum or thighs. After an opening has been effected into the diseased area, anterior and posterior to the anus, the channel may be laid open toward the anus or away from it, without severing more than a few fibers of the external sphincter.

*After-treatments* As soon as the patient is returned to his bed, if he is hospitalized, or before he leaves my office, if he is ambulatory, I introduce a suppository of

Stramonium Ext. grs.  $\frac{1}{2}$  (0.032 Gm.)

Thymol iodide. . . . . grs. 2 (0.130 Gm.)

Acetanalid. . . . . grs. 2 (0.130 Gm.)

and then put on a snug pad and T-binder.

The patient's bowels are not put at rest. He is not given an opiate, except for pain. On the evening of the second day he is given one ounce of mineral oil, by mouth, and a similar dose night and morning thereafter, as needed to insure a soft unirritating stool. If the bowels do not move on the third day, he is given, that evening, a level teaspoonful of compound licorice powder.

Each night and morning, beginning on the second day, the patient is given a warm sitz bath, to keep the external parts clean and to relieve local congestion.

Every third day, all granulating surfaces are swabbed with mercurochrome and, if granulations seem sluggish, they are touched with 10% silver nitrate solution.

If extensive channel formation has taken place, so that mucous reservoirs are formed at various points in the tissues about the buttocks, a persistent flow of irritating mucus may continue to cause annoyance. Under such circumstances, further search must be made for mucous channels or sacculations, until all have been reached and destroyed. Irrigation can sometimes reach these channels through counter openings, thus avoiding the necessity of opening the channel its whole length. If a probe, introduced into a sinus, can be observed along its course until the point comes near the skin, it is well to make a counter opening at this point and irrigate the channel through and through. There are, usually, but one or two main sinuses, although numerous small branches may exist; but when the principal ones are treated, the smaller branches will cause no further trouble.

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## SUDDEN DEATH FROM NATURAL CAUSES IN ADULTS

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Death suddenly thrust into apparent health startles by its abruptness, looses a surge of emotions and prompts those interested or concerned to cogitate and voice opinions as regards the cause for such unexpected disorganization of vital functions. Death from natural causes occurring unexpectedly in health or during some chronic illness, takes place within a few seconds, minutes, or after a few hours of serious illness (agony). Accordingly, the interval of time during which grave symptoms of disease are present and death occurs is flexible within limits. Aschoff<sup>1</sup> has defined sudden death as a rapidly fatal disorder, therefore not amenable for clinical diagnosis, initiated apparently spontaneously or by insignificant or unnoticed external factors. Some distinction has been made in the terms "sudden" and "unexpected" deaths, the latter, according to Brack,<sup>2</sup> implying death during an illness or stage of illness not considered serious. However fitting this differentiation may be, not all writers have followed the suggestion, and the terms are used interchangeably.

The element of surprise invariably accompanies sudden or unexpected deaths. The circumstances of medical attendance during an illness or at the time of death are important not only in offering some probable natural cause of death, but also sometimes in allaying suspicions of foul play. This review analyzes only the causes of sudden natural death, not of deaths caused by accident or violence. The external appearance of the body, the circumstances attending death and other presumptive factors suggest possibilities as regards the cause, but the actual conditions are revealed, of course, only by a thorough and competent postmortem examination. This examination establishes or refutes implications of foul play and points the direction of any further procedures. The causes of sudden natural death in children differ from those in adults.

Among the lecture notes of Doctor E. R. LeCount, who died on August 23, 1935, were those on sudden or unexpected death. This review has been prepared with their help and other references, only the important ones of which are listed.

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Statistics, accordingly, have been separated into those concerning sudden deaths in adults (above the age of 20 years) and those concerning deaths in infants, children and adolescents.

Sudden cessation of life may result from many causes. Haberda<sup>3</sup> stated that there is scarcely any acute or chronic illness which is not demonstrated occasionally by postmortem examination to be the cause of sudden death. Bichat's famous statement<sup>4</sup> that every kind of sudden death results from interrupted circulation, respiration, or brain function has lost some of its force, for according to Mühlmann,<sup>5</sup> there is no unanimity of opinion as regards which tissue, the heart, the lungs or the brain is the *atrium mortis* of the older authors. The *causa propria mortis* may be the main disease, but not necessarily the *causa proxima mortis*. Orth considered the heart the *atrium mortis*, and Nothnagel believed that most deaths proceed from the heart whether the fatal disease is chronic or acute, whether the heart is primarily or secondarily involved in the disorder, whether at the end of a long life, exhausted, it ceases to function, or in the full vigor of youth because of some insult to the body its pulsations stop. Ribbert believed that this view needs modification because with certain brain disorders such as spontaneous hemorrhages or severe trauma, death results from disturbed heart function due to paralysis or stimulation of the cardiac nerves. These theoretic considerations lead into a maze of speculation. They indicate, of course, that our knowledge of life functions and of the complex maintenance of the entire body as an organized living unit is limited. Such limitations are emphasized further by those postmortem examinations where even with great attention to thoroughness and detail a morphologic basis for the cause of death is not found.

Sudden death occurs according to many reports much more frequently in men than in women. It increases in frequency in both groups from the third to the sixth decade. The incidence is greater in the inclement and cold weather of late fall, winter and early spring, than in the warm summer months.

According to statistics, collected in many pathological institutes and laboratories,<sup>6 to 18</sup> diseases of the heart and blood vessels are the commonest natural causes of sudden death in adults. Among 330 consecutive patients where death resulted from some form of cardiac disease, Wil-

kins<sup>19</sup> reported that 38% had died suddenly. Of these cardiac disorders coronary sclerosis and its sequelae or associated myocardial damage such as scars and fatty changes of the heart muscle, cardiac rupture, myomalacia, thrombosis and embolism rank foremost. Syphilitic and senile sclerosis of the aorta with constriction of the orifices of the coronary arteries follow. In Weyrick's 550 unexpected deaths due to circulatory disturbances 49.8% were ascribed to this cause. He stated that death from such lesions usually is sudden in apparent health or with slight indisposition. Brack's<sup>20</sup> 30 sudden deaths due to syphilitic closure of the coronary arteries occurred in twenty-five men and five women. The orifice of the right coronary artery was closed in fifteen, the left in nine, and both in six. The anatomic conditions indicate that the closure had existed for a considerable time. The closure of a coronary artery, therefore, does not explain sudden death. There must be some abnormal relation of the blood or blood pressure. Excesses of various sorts in this group were considered to be precipitating factors.

Chronic valvular diseases of the heart caused sudden death in 5 to 18 per cent of several statistical reports. The lesions are mainly aortic and mitral, alone or combined. The distribution of sudden death between the sexes in this group is more nearly equal than with the other cardiac disorders. Nine of eleven patients with aortic stenosis, according to Marvin and Sullivan,<sup>21</sup> died suddenly and at a time when they appeared to be in their usual health. Acute endocarditis less frequently is a cause of sudden death. Patients with an unrecognized infection or without medical attention die unexpectedly from an embolus to the brain or coronary artery, or some other complication. Kidd<sup>22</sup> recorded instant death in a youth, aged 18 years, with subacute bacterial endocarditis and extensive ulceration of the septum and destruction of Tawara's Node. Other subendocardial ulcers intercepted the path of the left branch of the bundle of His. Instant death was due to sudden heart block followed by ventricular systole or fibrillation.

Syphilitic and senile sclerosis without involvement of the coronary arteries weakens the wall of the aorta and sudden death results from rupture into some important structure. In 100 of 128 patients with these aortic lesions in Weyrick's statistics, death occurred suddenly from

rupture. The tear was into the pericardial sac in 72. Atheromatous lesions of the aorta provide opportunity for embolism into vital structures.

Diseases of the myocardium exclusive of the obvious sequelae of embolism and thrombosis of the coronary artery form a varied group of causes for sudden death. Fatty changes of the heart muscle, according to Kolisko<sup>23</sup> and others, constitute an anatomic basis for sudden death. Subepicardial fat tissue replacement or invasion of the myocardium of the ventricles, especially with obesity, also is so regarded. Acute and chronic infections of the heart muscle, according to Hoffmann,<sup>24</sup> cause sudden death from cardiac insufficiency either during the infection or in convalescence, especially after diphtheria, and following pneumonia, scarlet fever, or other acute diseases. Krehl and Romberg, he stated, have demonstrated an acute myocarditis in many of these hearts. Aschoff, however, has refuted these statements. Acute inflammations of the myocardium involving the conduction system, the His-Tawara bundle and its branches have been reported by Demel<sup>25</sup> as the cause of sudden death. Fatty changes of conduction system, according to Nuzum,<sup>26</sup> have been noted many times. He described marked fat tissue replacement of the bundle system in the heart of a man who died suddenly. The specific infections of the myocardium, tuberculosis and especially syphilis, are important. Warthin<sup>27</sup> reported sudden death in eight adults due to an acute exacerbation or crisis of a previously latent myocardial syphilis. Most of the latent syphilitics, he stated, die a myocardial death, commonly because of an atrophy and fibrous tissue replacement of the myocardium due to progressive mild syphilitic lesions, to syphilis of the coronary arteries with secondary infarction and scarring, or to combinations of the two processes. Reference may be made here to sudden death due to rupture of a papillary muscle. Stevenson and Turner<sup>28</sup> collected nineteen reports and in half of this number death had occurred suddenly. The report by Power<sup>29</sup> includes syphilis among the possible causes for muscle damage preceding the actual rupture.

Cardiac hypertrophy with or without coincidental myocardial changes is associated with sudden cardiac death. Six of the thirty hearts with idiopathic hypertrophy reported by

Brack,<sup>30</sup> weighed 615 to 1210 grams, and the muscle tissues had small scars. Another eleven weighing 670 to 775 grams had large scars and were associated with syphilitic aortitis. The final thirteen hearts with so-called bland hypertrophy weighed 535 to 747 grams. These hearts came from the bodies of brewers, innkeepers, and wine salesmen, who for years had imbibed large quantities of fluids, especially alcoholic beverages. Brack considered a change in the height of blood pressure with acute overloading as a possible cause of sudden death.

Summarizing the pathology of angina pectoris, LeCount<sup>31</sup> stated that somewhere between sudden occlusion of the coronary arteries and its results, and such slowly developing obstructions with few or no clinical symptoms, lie the lesions responsible for angina pectoris. Thirty-four hearts, in his report, had fibrous myocarditis with sclerosis of the coronary arteries; twenty-six had acute occlusion of the coronary arteries. Leary's<sup>32</sup> observations suggest that spasm of the coronary arteries leads to attacks of angina or causes sudden death. Sudden death, particularly in hypertensive heart disease, is associated with coronary sclerosis but without thrombosis, and the lumens of the coronary arteries are large enough apparently to supply the needs of the heart muscle. When the channel of the coronary arteries is adequate and unobstructed, and the wall is elastic, the possibility of narrowing of the lumen by spasm seems a reasonable explanation for the disturbances observed.

Emotion, stress, psychic or physical stimuli, sudden changes in atmospheric conditions seem important as precipitating factors in patients with cardiac disorders. LeCount and Rukstinat<sup>33</sup> in a report of sudden death from heart disease while motoring stated that disseminated fibrous myocarditis with or without aneurysm of the wall of the left ventricle of the heart probably causes unexpected death more frequently than any other disease of the myocardium or coronary arteries. Congenital defects of the heart, aorta or pulmonary artery are the causes of some sudden deaths. Born,<sup>34</sup> in a report on malformation of the coronary arteries and their relation to sudden death, stated that when the right circumflex extends around the root of the aorta, strangulation of the artery may occur. He reported sudden death with this anomaly and described other anomalies which might cause severe



mechanical disturbances of circulation. According to Rukstinat and LeCount,<sup>35</sup> and Rukstinat<sup>36</sup> the cause of death with air embolism is obstruction of the coronary arteries. With fat embolism the same may occur.

Because death often seems to depend upon cardiac failure, Dieuaide and Davidson<sup>37</sup> studied in electrocardiograms the terminal cardiac arrhythmia. They observed several arrhythmia including auricular and ventricular fibrillation. McWilliams, they stated, has suggested that ventricular fibrillation is responsible for many sudden deaths of otherwise unknown cause. Such serious disturbances in cardiac function have no anatomic criteria, although various cardiac or extra-cardiac lesions may initiate the functional derangement. According to Reuter in a discussion of the anatomic lesions with cardiac death, nothing remains when no serious cardiac lesion is disclosed by careful postmortem examination but to consider all of the circumstances, especially just before death, and by exclusion reach the diagnosis of cardiac disease. He stated that hypoplasia of the arterial system may be a factor in sudden death.

Compression of the heart by hemorrhage into the pericardium from a ruptured aorta, coronary artery, or other blood channel is a frequent cause of sudden death. Weyrich and others report sudden death with various forms of acute and chronic obliterative fibrous pericarditis.

Diseases of the respiratory passages caused sudden death in 14 to 23.36% of several reports. The acute lobar and bronchopneumonias exceed by far all other non-specific infections of the lungs in these statistics. All forms of pulmonary tuberculosis accounted for 33.71% of sudden deaths due to disorders of respiration in Weyrich's tabulations and for 16.4% in Koopmann's. Where details of the extent and variety of pulmonary tuberculosis are given, as by Weyrich, both lungs as a rule were diseased, especially the apices and upper lobes. The lesions were ulcerative or cavernous. A few sudden deaths resulted from an acute tuberculous pleuritis with abundant sero-fibrinous, hemorrhagic exudate and compression of the lung. A closely related cause of sudden death in pulmonary tuberculosis, according to Weyrich, is the weakening of the secondarily diseased heart. Hemorrhage into a tuberculous cavity was second in importance. A few sudden deaths resulted from

tuberculous pneumothorax and some from an acutely disseminated miliary tuberculosis. Chronic bronchitis and emphysema of the lungs are causes of sudden death, especially in the aged and in those with complicating disorders of the heart and blood vessels. Sudden death has occurred from pneumothorax due to a ruptured lung with bullous emphysema.

Pulmonary embolism, the impaction in the lungs of clots floating from large veins, is a well-known and dramatic cause of sudden death. In Koopmann's statistics, pulmonary embolism constituted 1.2% of the total sudden deaths, in Schneider's 5.7% and in Weyrich's 7.54%. Thrombi in veins of the lower extremity and of the pelvis are the common but not sole sources of pulmonary emboli. According to conclusions by Villaret, Justin-Besancon, Pardin and Delarue<sup>38</sup> pulmonary embolism acts directly upon the respiratory and circulatory functions of the lungs, or the acute blockage initiates a series of general phenomena in the arterioles.

Sudden death from asphyxia has occurred with acute edema of the glottis and larynx; with stenosis of the trachea from an enlarged or fibrous thyroid gland; with aspiration of a foreign body, vomitus, or blood; with luetic strictures of the larynx, trachea, or bronchi; with acute infections such as diphtheria and anthrax; with chronic tuberculous or rhinoscleroma lesions of the larynx; with compression of the trachea or lungs by mediastinal tumors; with hemorrhage from a bronchiogenic carcinoma; and with the bronchospasm of an acute attack of asthma.

Sudden death from diseases of the brain and meninges occurred in 6 to 8.8% of several statistical reports on sudden death. Merkel had 21.3% cerebral lesions in 249 sudden deaths at Munich. Spontaneous hemorrhages of the cerebrum, cerebellum and pons, and of the brain stem in the order mentioned rank foremost among these disorders. According to quotations from Brouardel and from Osler by Bedford, cerebral hemorrhages rarely cause sudden death. However, with 29 of the 42 cerebral hemorrhages in the tabulations by Pieczarkowski and Olbrycht, death occurred instantaneously. Then in importance are intermeningeal hemorrhages from rupture of an aneurysm of an artery at the base of the brain. Forbus<sup>39</sup> concluded from a study of miliary aneurysms of the superficial cerebral arteries that an embryonic muscular defect of the

arterial wall is responsible for many of the aneurysms. Senile sclerosis and syphilitic sclerosis of the arteries at the base of the brain are also responsible for hemorrhage or thrombosis. Among other lesions of the brain and meninges mentioned as causes of sudden death are various primary or metastatic tumors, purulent meningitis, epidemic cerebrospinal meningitis, encephalitis, syphilitic meningitis, subdural hemorrhage, epilepsy, premature closure of cranial sutures, cysts of the brain, embolism of the arteries to the brain, cysticercus, hypophyseal tumor, abscess of the brain, malformations, and defects.

According to Brack,<sup>40</sup> certain disorders of the kidneys cause sudden death. They occur in kidneys previously healthy, or more often, in kidneys already diseased. The disease progresses rapidly, the patient knows little or nothing of a fulminant kidney disorder and dies unexpectedly. Weyrich reported chronic diseases of the kidney and uremia as the most frequent cause of sudden death among the disorders of the urinary system. Purulent and tuberculous ascending or descending infections, urinary obstruction by concretions or abnormal tissues and the complications of tumor growths in the urinary tract are occasionally associated with sudden death.

Diseases of the genital system, almost exclusively of the female, cause unexpected death. The complications of pregnancy such as eclampsia, ruptured extrauterine pregnancy, spontaneous rupture of the uterus, hemorrhage, septic infections and embolism are mentioned. Among the diseases not associated necessarily with pregnancy are carcinoma of the uterus or ovary, hemorrhage from an ovarian or uterine tumor, and ruptured ovarian cyst.

Sudden death from diseases of the gastrointestinal tract occurred to the extent of 6% in Weyrich's material. In the order of frequency were stenosis and occlusion of the bowel (herniations), epithelial tumors of the digestive apparatus, ulcers of the stomach and bowel, catarrhal inflammation of the stomach, tuberculosis of the bowel, phlegmonous appendicitis, thrombosis and embolism of the mesenteric blood vessels, and ruptured varices of the esophagus.

Pieczarkowski and Olbrycht mentioned in sequence, intestinal obstruction, ulcers of the stomach or bowel, inflammation of the stomach and bowel, tumors of the digestive tract and tuberculous peritonitis. The bacillary and amebic

dysenteries, the acute enteritides, typhoid fever and anthrax are mentioned among the specific infections associated with sudden death.

Acute hemorrhagic pancreatitis, scar tissue replacement or the retrogressive changes with diabetes, and the sequelae of pancreatic duct obstruction are pancreas disorders causing sudden death. Among the diseases of liver mentioned as the cause of sudden death are biliary concretions, ruptured cyst, hydatid cysts, cirrhosis of the liver, perforated phlegmonous cholecystitis and perforated carcinoma of the gall bladder.

Spontaneous hemorrhage into the suprarenal glands occurs more frequently in children than in adults. Death follows within a short time<sup>41</sup> and rarely are the clinical symptoms interpreted correctly. Bilateral tuberculosis and sarcoma metastases were mentioned by Weyrich as other lesions of the suprarenal glands associated with sudden death. Sudden death from hemorrhage into the parathyroid glands is recorded by Habberda. Sudden deaths occur from extensive spontaneous internal or external hemorrhage, but other disorders of the blood seem to have no great importance.

Death in certain psychoses, according to Davidson<sup>42</sup> results from the liberation of toxic substances in the body, tentatively considered of the histamine group. They produce a marked dilatation of the visceral capillaries and retard the regeneration of the blood. The results are arterial oligemia and cardio-vascular collapse. Commenting on natural death as the result of great excitement in acute psychoses without actual anatomically demonstrable cause, Stefan<sup>43</sup> stated that extra-systoles, tachycardia and fibrillation of the heart can be aroused by the central nervous system through the cardiac nerves. Sudden cardiac death, he stated, may occur from fear and fright because of fibrillation, in a heart without disease.

Lamson<sup>44</sup> concluded in a review of sudden deaths following injection of substances, such as serums, toxins and foreign proteins, that the intravenous or intradermal injection of a relatively small amount of foreign protein may result in death and that the subcutaneous injection of somewhat larger amounts also has caused death. About 34% of such patients, he stated, have a definite history of asthma or hay fever. According to Gruber,<sup>45</sup> sudden death has occurred with typhoid immunization. Benda,



he stated, had observed no specific changes in two bodies. Such accidents, not within the scope of this review, emphasize how some trivial therapeutic procedures occasionally cause sudden death. Careful and thorough postmortem examinations should be made to exclude any other unrecognized factor in these precipitous deaths.

Much has been written about status lymphaticus as a cause or contributing factor in sudden death. The lengthy report published by Young and Turnbull,<sup>46</sup> representing the committee organized by the British Medical Research Council and the Pathological Society of Great Britain and Ireland to investigate "status lymphaticus," stated, with other conclusions, that the presence of an abnormally large thymus, in itself, does not indicate status thymico-lymphaticus, when no obvious cause for death is found. The committee affirmed the views of Hammar, and Greenwood and Woods that the facts obtained afford no evidence of a "status thymico-lymphaticus" as a pathological entity. Neureiter<sup>47</sup> believed a constitutional factor plays a role in sudden death following electrical injury. This element, of course, is difficult to determine anatomically, as are the so-called hypersensitive conditions and sudden death while bathing in cold water. Sudden deaths such as these with few or no specific changes in the viscera are problems for investigation. They, the so-called hereditary sudden deaths, and those of senility are difficult to analyze, and individual interpretations range widely.

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#### SIGNIFICANCE OF SEROLOGIC TYPES AMONG MENINGOCOCCI

According to Sara E. Branham, Washington, D. C. (*Journal A. M. A.*, Feb. 27, 1937), classifications of meningococci, worked out in the years 1909-1918, represented true serologic relationships which can be plainly recognized today. Certain changes in these relationships have taken place; types I and III have become so closely interrelated that separation into two types no longer seems to be of definite value in practical everyday work. This I-III or A group has become markedly predominant in nearly all parts of the world. On the other hand, types II and IV have in the United States at least become entirely distinct from each other so that they do represent two separate groups. There seem to be three types of meningococci: I-III, II and IV. The designation B cannot be well applied to a combination of two such distinct groups as II and IV. Studies seem

to indicate a greater number of type II strains in carriers. This large number of carriers of strain II in proportion to the very small number of type II cases brings up this question: Is II less pathogenic than I-III? This idea finds some support in the following fact: Although 70 per cent of all strains isolated from blood were type II, nearly all the cases of meningococcic endocarditis in which the type has been determined have been due to the I-III group. There is some evidence that type II is especially apt to be responsible for septicemic and generalized forms of meningococcic infection, which may be relatively mild or chronic. Both the endotoxins of Gordon and the soluble toxins reported by Ferry are produced to a greater extent by the I-III group. Thus one finds at present a predominance of that group of meningococci which seems to be both more invasive and more toxic.

#### DIFFUSE ADENOMATOSIS OF COLON

With the addition of two cases completed within the last year, their series now totals thirteen cases, in seven of which, as previously reported, Fred W. Rankin and Allen E. Grimes, Lexington, Ky. (*Journal A. M. A.*, Feb. 27, 1937), removed the entire colon and rectum by multiple procedures. In six cases the colon was removed to the rectosigmoid juncture. These operations were undertaken for both adenomatosis and complications arising from diffuse chronic ulcerative colitis. In the earlier cases the more radical total colectomy was done for both lesions. Now it is reserved for chronic ulcerative colitis. The remarkable disappearance of diffuse rectal polyps following vigorous fulguration encourages the authors to save the rectal stump and anastomose it with the ileum. However, they condemn any method whereby segments of the colon beyond the rectosigmoid are preserved. They are a definite menace as a site of recurrent polyps and are beyond the range of proctoscopic investigation. In this series there was one operative death following the second stage colectomy. Another patient died eighteen months following the completed operation from recurrence of carcinoma, which had developed on polyps and which was demonstrated at exploration.

APPENDICITIS strikes rapidly and a critical condition may result in a few hours. Many deaths are caused annually by the use of cathartics for a "stomach ache" which is really the pain of appendicitis. Most appendicitis deaths are avoidable, if prompt medical attention is obtained. A total of 18,000 persons die annually from the disease in the United States.

### Society Proceedings

#### HENRY COUNTY

The annual meeting of the Henry County Medical Society was held in the Elks Club Rooms in Kewanee, Illinois, Thursday, May 6.

The following officers were elected by acclamation: President, Dr. Worley R. Young, Geneseo; vice-president, Dr. Chas. A. Coffin, Kewanee; secretary and treasurer, Dr. P. J. McDermott, Kewanee.

Following the business session two scientific and instructive talks were given by the following:

J. P. Greenhill, M. D., Chicago: "Recent Advances in Obstetrics."

I. Harrison Tumpeer, M. D., Chicago: "Allergy in Children."

P. J. McDermott, Secretary.

### Marriages

WALTER RAYMOND WASCHICK, Rossville, Ill., to Miss Mellie Gant at Sheldon, January 30.

### Personals

Dr. Richard Davison addressed the Florida Tuberculosis and Health Association in Miami, Florida, May 3 and 4, on "The Surgery of Pulmonary Tuberculosis."

Drs. I. H. Tumpeer and J. P. Greenhill addressed the Annual Meeting of the Henry County Medical Society at Kewanee, May 6, on "Allergy in Children" and "Recent Advances in Obstetrics."

Drs. D. A. Horner and Achibald L. Hoyne presented papers on obstetrics and pediatrics before the Fulton and McDonough County Medical Societies on May 12.

Drs. R. M. Grier and L. W. Sauer presented papers on "Puerpera Sepsis" and "Diseases of the Newborn" at the May 5th meeting of the Fulton and McDonough County Medical Societies.

Drs. Charles B. Reed and George Mohr presented papers on "Breech Delivery-Version and Extraction," and "Medical Complications of Pregnancy" and "Child Guidance" before the physicians of Menard and Mason Counties at Mason City on May 4.

The newly elected Officers of the Chicago Ophthalmological Society are: President, Thomas D. Allen; Vice-President, Georgiana Theobald; Councilor, Leo Mayer; Secretary-Treasurer, Earle Fowler; Corresponding Secretary, Robert Von der Heydt.

Dr. Fred H. Albee, New York, discussed "Surgical Restoration of Lever at the Top of the Femur" before the McLean County Medical Society, April 15, in Bloomington.

Dr. Max Thorek has been made a corresponding member of the National Academy of Medicine of Colombia, South America.



Dr. Clarence F. G. Brown, Chicago, addressed the Lake County Medical Society, April 12, on medical management of intractable ulcer and medical management of low grade gallbladder disease.

Dr. Disraeli W. Kobak has received from Belgium the diploma and insignia of a commander of the Royal Order of St. George in recognition of his work in physical medicine.

Dr. Walter C. Alvarez, Rochester, Minn., addressed the Vermillion County Medical Society in Danville, April 6, on "Diagnosis and Management of Some of the Commoner Gastro-Intestinal Tract Disorders."

Dr. Robert R. Smith has resigned as superintendent of the Kankakee State Hospital, Kankakee, to return to private practice, it is reported. Dr. George W. Morrow is acting head of the institution.

The North Side Branch of the Chicago Medical Society held its annual May party at the Lake Shore Athletic Club, May 6. Dr. Frank P. Thompson showed motion pictures of "An African Hunting Trip."

At a meeting of the Mercer County Medical Society, Aledo, April 13, Drs. Frederick H. Lamb, Davenport, Iowa, presented a paper on "Comparison of Defects in Various Types of Anemia," and Harold M. Camp, Monmouth, "The Eradication of Syphilis."

There is a residency open in physical therapy at Michael Reese Hospital, effective July 1. Applicants must be graduates of class A schools and must have completed their internship. Additional information may be obtained from Dr. Charles O. Molander at the hospital.

Dr. Joseph B. De Lee wishes to obtain two or three cases of eclampsia for a motion picture. The patients may be sent to the Chicago Lying-In Hospital, where the physician may continue his own treatment. No charge for hospital care or ambulance will be made.

Constituent societies of the eighth district were addressed, April 7, by Drs. Winston H. Tucker and Paul H. Harmon, both of the state department of public health, and Harold M. Camp, Monmouth, secretary, Illinois State Medical Society, on the social security act.

Dr. Albert Bessemans, formerly rector, University of Ghent, Belgium, lectured April 23 under the auspices of Northwestern University Medical School and the Institute of Medicine of

Chicago, on "Experimental Data on Antisyphilitic Hyperpyrexia Produced by Physical Agents."

Dr. Erich Hoffmann, professor of dermatology and syphilology, University of Bonn, Bonn, Germany, co-discoverer of *Spirochaeta pallida*, will lecture on syphilis at the University of Illinois College of Medicine, May 11, from 1 to 5 p. m., in room 423. Members of the Chicago Medical Society are invited.

The St. Clair County Medical Society was addressed in Belleville, April 7, by Drs. Duff S. Allen and Cyril M. MacBride, both of St. Louis, on surgical treatment of toxic goiter and borderline goiter conditions respectively. Dr. Willard C. Scrivner addressed the East St. Louis meeting, April 1, on cancer of the uterus.

Dr. Abraham A. Low, Chicago, discussed "Insulin Shock Therapy in the Treatment of Dementia Praecox" before the Kankakee County Medical Society, Kankakee, April 9; Dr. Robert R. Smith, then managing officer of the Kankakee State Hospital, was host to the society at a dinner preceding the lecture. The society was addressed at a special meeting, April 2, by Dr. Edwin S. Hamilton, Kankakee, on "The Future of the Practice of Medicine."

Dr. Max Thorek addressed the Logan County Medical Society at Lincoln, Ill., May 13, on "Three Hundred Cases of Electrosurgical Obliteration of the Gallbladder."

Dr. E. J. Steiglitz, Chicago, discussed "The Causes and Treatment of Hypertensive Arterial Disease" before the Kankakee County Medical Society, May 13.

Dr. Perry B. Goodwin, Peoria, formerly Radiologist at St. Francis Hospital of that city, has returned from post-graduate work and rest, and has accepted the position as locum tenens at the Carle Hospital clinic, Urbana, Ill., relieving Dr. Gianturco, who is spending two months in Italy.

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## News Notes

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—This issue of the Journal carries the portrait cut of Dr. Rollo K. Packard, President of Illinois State Medical Society, 1937-1938, as a supplement.

—The Institute of Traumatic Surgery held an all day session at St. Luke's Hospital, April

23; the guest speaker was Dr. Willis C. Campbell, Memphis, Tenn., and his subject, "Ununited Fractures of the Neck of the Femur."

—A survey of air pollution in Chicago is under way, with I. A. Deutch, combustion engineer for the city's smoke abatement department, and Alamjit D. Singh, M.S., of the University of Illinois, Urbana, in charge. The tests will show the amount of sulfur dioxide and carbon and other dust particles in the air, it was reported.

—At a meeting of the Chicago Society of Internal Medicine, April 26, the speakers included Drs. Lester R. Dragstedt, John Van Prohaska, Paul B. Donovan, Ph.D., and Dr. William A. Geer on "Lipocaic, a New Pancreatic Hormone," and Richard L. Webb, Ph.D., "Mesenteric Lymphatics: Analysis of the Mechanism of Drug Action as Revealed by Motion Pictures."

—Dr. George E. Wakerlin, professor of pharmacology and physiology, University of Louisville School of Medicine, Louisville, Ky., has been appointed professor and head of the department of physiology at the University of Illinois College of Medicine, effective September 1. Dr. Wakerlin will succeed Dr. Maurice B. Visscher, who resigned to accept a position at the University of Minnesota School of Medicine as professor and head of the department of physiologic chemistry in September, 1936. Dr. Wakerlin, who is 35 years of age, graduated from Rush Medical College in 1929.

—Two talks by Drs. Charles E. Galloway, Evanston, and John A. Bigler, Highland Park, May 26, concluded the series of lectures on obstetrics and pediatrics which have been given throughout the state recently. Their subjects are, respectively, "Treatment of Abortions" and "Tuberculosis." When the present series ends, thirty lectures will have been given in groups of six each in Dewitt, Logan, Sangamon, McLean, Menard, Mason, Fulton and McDonough counties. It is hoped to resume the series in the fall. Dr. Harold H. Hill, formerly associate in the department of obstetrics and gynecology, University of Illinois College of Medicine, as field consultant, is in charge of arrangements for these lectures, which are a part of a national program to improve conditions of mothers and children in rural areas.

—The Chicago Medical Society held its second annual hobby show in the lounge of the Medical

and Dental Arts Building, April 7-8. About fifty physicians had entries in the exhibit, which, during the two days, had an attendance of about 1,500 persons. Wednesday evening, Dr. Louis J. Tint gave an illustrated lecture on "Tropical and American Gardens" and "Some Views of the Cascade Range," all photographed in natural colors, and Dr. Frank P. Thompson displayed motion pictures of his recent hunting trip to Africa. Dr. Carl O. Schneider lectured Thursday evening on Bryce Canyon National Park and garden and flower scenes, which were illustrated by direct color photography, and Dr. Julius H. Hess presented a natural color motion picture of Chicabo. Among the exhibits were stamp collections, paintings, camera studies and wood work, a collection of mounted specimens of leaves of common weeds that transmit hay fever, and plaster studies in obstetric anatomy.

—To accommodate a fifty per cent increase in business this year which has been enjoyed to date by the Root-Mandabach Advertising Agency, 20 North Wacker Drive, Chicago, increased space has been rented for a long term period in the Michigan Erie Building, 646 North Michigan Ave. Occupancy May 1, 1937.

Managing Director Paul J. Mandabach said: "While we are going to the Upper Avenue the welcome mat (for the representatives and publishers) is going right along with us to 646 North Michigan Avenue."

—We call attention to the direct-mail campaign of The Wander Company. This consists of a series of mailings of four-page pamphlets describing the results of research on Ovaltine. The first of this series deals with the effect of Ovaltine on the digestion of starches and the influence which this property exerts on gastric emptying time. The tone of the bulletin is dignified and conservative both in typography and copy. This type of promotion should be well received by the profession.

—The annual Alumni-Faculty-Student dinner of the University of Illinois College of Medicine will be held at the Medinah Club of Chicago on Thursday, June 10, at 6:30 P. M. Alumnus dinner \$2.75. Guest dinner \$2.00. Mail reservations to Dr. M. H. Streicher, Secretary, 1853 W. Polk Street, Chicago, Ill.

—Alpha Epsilon Delta Honorary Premedical Fraternity announces the installation of the Illinois Alpha Chapter at Illinois Wesleyan Uni-



versity, Bloomington, on Friday, May 21. Dr. Emmett B. Carmichael, Professor of Physiological Chemistry at the School of Medicine, University of Alabama, and Grand President of the fraternity, conducted the installation ceremonies. This marked the installation of the eighteenth chapter since the establishment of the fraternity at the University of Alabama in 1926.

—Dr. Haven Emerson will talk on "The District Health Center—An Indispensable Instrument of the Civil Government of Large Cities" at the annual meeting of the Health Division of the Council of Social Agencies, Tuesday, June 15, 1937, at 6:30 P. M., at the Chicago Woman's Club, 72 East Eleventh Street.

Dr. Emerson is Professor of Public Health Practice at the College of Physicians and Surgeons of Columbia University, member of the Board of Health of New York City, and Director of the Hospital Survey of New York.

Members of the Illinois State Medical Society are invited to attend. For reservations write Council of Social Agencies, 203 North Wabash Avenue, or call State 8394. (Price of dinner \$1.10.)

## Deaths

LUTHER G. BASS, Chicago; Rush Medical College, Chicago, 1880; member of the Illinois State Medical Society; aged 88; died, March 20, of coronary thrombosis and arteriosclerosis.

ELI H. BRADFORD, Rock Island, Ill.; Chicago Homeopathic Medical College, 1886; member of the Illinois State Medical Society; aged 75; died, March 3, of cardiorenal disease.

LEWIS E. CLARK, Mansfield, Ill. (licensed in Illinois in 1880); aged 90; died, March 5, in the Mercy Hospital, Urbana, of an embolism, resulting from a hip fracture received in a fall.

ALVIN P. DEWEY, Elgin, Ill.; Rush Medical College, Chicago, 1884; aged 77; died, March 30, of chronic myocarditis and hypertension.

JOSEPH J. L. FINNELL, Peoria, Ill.; Louisville (Ky.) Medical College, 1898; aged 68; died, February 18, of carcinoma of the bladder.

HENRY WALTER KROHN, Kane, Ill.; Rush Medical College, Chicago, 1891; aged 69; died, February 23, at Our Savior's Hospital, Jacksonville, of pneumonia.

SAMUEL L. LASWELL, Alma, Ill.; Central College of Physicians and Surgeons, Indianapolis, 1898; member of the Illinois State Medical Society; aged 62; died, February 26, of cerebral hemorrhage.

SAMUEL W. LEHMAN, Dixon, Ill.; Rush Medical College, Chicago, 1899; member of the Illinois State Med-

ical Society; formerly on the staff of the Dixon Public Hospital; aged 70, died, March 9, of chronic myocarditis.

ERNEST CHARLES RIEBEL, Chicago; Northwestern University Medical School, 1900; a Fellow, A. M. A.; formerly instructor in surgery at his alma mater; on the senior surgical staff of the Englewood Hospital; aged 71; died, March 28, in the Albert Merritt Billings Hospital, of morphine poisoning.

AURELIUS THOMAS SIEMIANOWSKI, Chicago; Chicago Medical School, 1927; a Fellow, A. M. A.; aged 34; on the staff of the Auburn Park Hospital, where he died, February 25, of bronchopneumonia.

ALFRED STOCKER, Rock Island, Ill.; Barnes Medical College, St. Louis, 1900; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; served during the World War; aged 67; died, March 20, in St. Anthony's Hospital of coronary thrombosis.

OSMOND PETER THOMPSON, Chicago; College of Medicine and Surgery, Chicago, 1909; aged 63; died, February 28, in the Illinois Masonic Hospital, of gastric ulcer and hemorrhage.

SARAH V. TILTON, Rossville, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1882; aged 83; died, February 14, in a hospital at Danville, of arteriosclerotic heart disease.

ALFRED TREMBLAY, Moline, Ill.; Detroit College of Medicine, 1906; a Fellow, A. M. A.; on the staff of the Moline Public Hospital; aged 60; died, March 1, of coronary thrombosis.

HENRY STEVENS TUCKER, Chicago; Bennett Medical College, Chicago, 1879; a Fellow, A. M. A.; demonstrator of anatomy at his alma mater, 1879-1883; professor of surgery, attending and consulting physician to the Bennett College Hospital, 1889-1900; dean and professor of surgical gynecology at the Chicago College of Medicine and Surgery, 1902-1914; for six years attending surgeon to the Cook County Hospital; aged 83; died, April 21, of edema of the lungs, chronic myocarditis and essential hypertension.

FREDERICK JOHN WATSON, Chicago; Rush Medical College, Chicago, 1893; member of the Illinois State Medical Society; aged 67; died, February 2, in the Presbyterian Hospital, following an operation for carcinoma of the colon.

ERNST ZIMMERMAN, Quincy, Ill.; Washington University School of Medicine, St. Louis, 1897; Fellow of the American College of Surgeons; aged 60; on the staff of the Blessing Hospital, where he died, February 10, of cardiovascular renal disease.

## CORRECTION

The James E. Cunningham whose death at Hines Jr. hospital, January 27, was recorded in May Journal was not the Dr. James E. Cunningham who was graduated from Northwestern University Medical School in 1896 as stated. The decedent was a student in two other schools in 1913-1916, but no records of graduation or licensure are available.

# DIARRHEA

*“the commonest ailment of infants  
in the summer months”*

(HOLT AND McINTOSH: HOLT'S DISEASES OF INFANCY AND CHILDHOOD, 1933)

**One of the outstanding features of DEXTRI-MALTOSE is that it is almost unanimously preferred as the carbohydrate in the management of infantile diarrhea.**

## SERIOUSNESS OF DIARRHEA

There is a widespread opinion that, thanks to improved sanitation, infantile diarrhea is no longer of a serious aspect. But Holt and McIntosh declare that diarrhea "is still a problem of the foremost importance, producing a number of deaths each year. . . ." Because dehydration is so often an insidious development even in mild cases, prompt and effective treatment is vital. Little states (Canad. Med. A. J. 13: 803, 1923), "There are cases on record where death has taken place within 24 hours of the time of onset of the first symptoms."

In diarrhea, "The sugar is added gradually, conditions admit, some sugar other than milk sugar or cane sugar being used, preferably dextrin and maltose."—H. E. Small: *Diarrhoea in bottle-*  
*and infants*, J. Maine M. A. 12:152-158, Jan. 1932.

In diarrhea, "Carbohydrates, in the form of dextri-maltose, well cooked cereals or rice, usually can be handled without trouble."—B. B. Jones: A discussion of some of the commoner types of infantile diarrhea, and the principles of the diets used in their treatment.

Most desirable sugar is dextri-maltose.

Concerning the treatment of diarrhea, "If the weight remains stationary, it is an indication that loss of substance is occurring through the stools, mostly in the form of alkaline salts. To equalize this loss of substance, the diet must be increased, this loss of substance may be done by adding lactose in various ways as to avoid causing fermentation. This may be done by adding 100 grams of lactose and preparations of protein in the food, increasing the calories until the infant is taking 160 calories per kilo, of body weight."—H. L. Rahnoff. *Nutritional disturbances, Arch. Pediat., 41:771 Nov., 1924.*

The Professor was the development of protein milk or lactic acid mixtures and the use of butte diarrhoea a food containing 2 calories to the ounce like protein milk, after only one day on the preventative diet, is apparent. In addition the further advantage of being able to safely add the further amount of Dextro-Maltose No. 1 or No. 2 to the protein milk within a few days enables one to gradually bring the infant up to its basal need in a short time. When protein milk is used the carbohydrate additions were made to its basal need, the result that the infant was able to eat.

"It should be noted that 50 per centage of lactose may be substituted by a mixture of 10 per cent lactose and 40 per cent whey where the manufacturers desire to avoid excessive fermentation in the practices in which the product is used."—G. J. Feldstein; 6:38, 1930; 4:48, 1931.

Regarding the treatment of diarrhœa, "In our experience, the most satisfactory carbohydrate for routine use is Mead's dextrimaltose No. 1." —F. R. Taylor: "Summer Complaints," Southern Med. & Surg., pp. 555-559, August, 1927.

In cases of diarrhea, "For the first day or so no sugar should be added to the milk. If the bowel movements improve carbohydrates may be added. This should be the one that is most easily assimilated, so dextro-maltose is the carbohydrate of choice."—*W. M. McCuslan: Summer diarrheas in infants and young children, J. M. A. Alabama. 1:278-282, Jan., 1932.*

"If it is desired to feed an unusually large amount of sugar to a baby, it is well to use a maltose-dextrin preparation, as in this way there is less danger of bringing about this sugar fermentation than if lactose were used."—L. W. Hull: *Practical Infant Feeding*, W. B. Saunders Co., Philadelphia, 1922, p. 206.

"I've usually one-third milk, usually skimmed at first, and a half ounce of Dextro-Maltose as the carbohydrate. I prefer Dextro-Maltose as the carbohydrate because it is more easily digested. . . . Preparations containing the more maltose are more rapidly absorbed, but on the other hand, are more liable to produce diarrhea. . . . Lactose which was very popular a long time, is never used in our work. The consensus of opinion seems to be that milk sugar is often the cause of indigestion in normal infants and the primary cause of fermentative dyspepsia in infants. . . . J. H. Redding, Jr., *St. Louis* 1933."

Protein milk may be continued for several weeks when a gradual transition to a whole milk or evaporated milk formula, which will supply about one and one-half to two ounces of whole milk to every pound of body weight, is reached. This also should finally have the addition of dextrin-maltose amounting to five to seven per cent. — R. A. Strong: Summer diarrheas in infancy and early childhood, Arch. Pediat. 47:344-354, 1930.

diarrhea, "Dextri-maltose  
ated as the most  
for, they do not ferment  
ally given beyond 6  
and leave very little  
rhea in many infants.  
A. Zenkle: Protein milks  
avoided and if it is de-  
Pedial., 42:743-760, Nov.,  
dent of carbohydra-  
is lactose by dextri-maltose  
used to partly  
mixtures (Mead's Nos. 1 and 2). In our view can-  
sugar is less suitable than lactose, and if for any  
reason there is objection to the use of lactose,  
is obtained by the addition of carbohydrates, while  
fat and casein are reduced. For this purpose dex-  
trimaltose and flour are better than the ordinary  
sugars, since they are more slowly absorbed and  
have greater efficacy in their powers of controlling  
the flora in the large intestine. W. J. Pearson  
G. Wylie: Recent Advances in Diseases  
Co., Phila., 1930.

For cases of fermentative diarrhea, "... the ideal plan of treatment would be to give a food which is low in sugar (the food which that group of organisms thrive on) and high in protein. Calcium caseinate milk accomplishes this purpose. In our series of cases, we found it was necessary to then top it off with added dextrose to the formula."—A. G. DeSantis and L. J. Pender. *The value of calcium caseinate milk in fermentative diarrhea*, Arch. Pediat., 1934, 51, 101.

Just as DEXTRI-MALTOSE is a carbohydrate modifier of choice, so is CASEC (calcium caseinate) an accepted protein modifier. Casec is of special value for (1) colic and loose green stools in breast-fed infants, (2) fermentative diarrhea in bottle-fed infants, (3) prematures, (4) marasmus, (5) celiac disease.

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## BUYERS INDEX

### ABDOMINAL SUPPORTERS

Storin, Katherine L., M. D., 1701 Diamond St., Philadelphia, Pa. .... 23

### FOODS

Coca-Cola Co., Atlanta, Ga. .... 23  
 Corn Products Refining Co., New York City. .... 4  
 R. B. Davis Co., Hoboken, N. J. ....  
 Knox Gelatine Laboratories, Johnstown, N. Y. .... 12  
 Mead Johnson & Co., Evansville, Ind. .... 19  
 Ralston Purina Co., St. Louis, Mo. .... 13  
 S. M. A. Corporation, Cleveland. .... 2  
 The Wander Company, 180 N. Michigan Ave., Chicago. .... 11

### FINANCIAL AND INSURANCE

Medical Protective Co., Fort Wayne, Ind. .... 8  
 Physicians Casualty Co., Omaha, Neb. .... 31

### HOSPITALS

Stokes Hospital, Louisville, Ky. .... 31

### HOTELS

Bellevue-Stratford, Philadelphia .... 26

### INDUSTRIAL HYGIENE

Dr. C. O. Sappington, Chicago. .... 32

### PHARMACEUTICALS

American Agency, French Vichy, Brooklyn, N. Y. ....  
 American Can Co., 230 Park Ave., New York City. .... 3  
 Archer-Daniels-Midland Co., Minneapolis, Minn. .... 29  
 Arlington Chemical Co., Yonkers, N. Y. .... 16  
 Armour & Co., Chicago. .... 10  
 Bovine Company, Chicago. .... 20  
 Bristol-Myers Co., New York. ....  
 Carnrick, G. W., Co., 411 Canal St., New York City. .... 17  
 Chappel Laboratories, Rockford, Ill. ....  
 Ciba Company, Cedar and Washington St., New York City. 28  
 Denver Chemical Co. .... 24  
 Gold Pharmacal Co., New York City. .... 31  
 Harrower Laboratory .... 33  
 Hoffman-LaRoche, Inc., Nutley, N. J. .... 7  
 Hynson, Westcott & Dunning, Charles and Chase Sts., Baltimore .... 31  
 Lilly, Eli & Co., Indianapolis, Ind. .... 18  
 Merck & Co., Rahway, N. J. .... 14

Morris, Philip, & Co., 19 Fifth Ave., New York. .... 8

Nutrition Research Laboratory, 332 S. Michigan Ave., Chicago .... 27

Parke, Davis & Co., Detroit, Mich. .... 5

Petrolagar Laboratories, 8134 McCormick Blvd., Chicago Opp. p. 8

Rare Chemicals, Nepera Park, N. Y. .... 9

Reed & Carnrick, Jersey City, N. J. ....

Schering & Glatz, Inc., New York City. ....

G. D. Searle & Co., 4737 Ravenswood Ave., Chicago. ....

Sharp & Dohme, 41 John St., New York City. .... 17

E. R. Squibb & Sons, New York .... 35

Frederick Stearns & Co. .... 15

Tilden Company, New Lebanon, N. Y. .... 28

U. S. Standard Products Co., Woodworth, Wis. .... 34

Wm. R. Warner & Co., 113 W. 118th St., New York City.

Winthrop Chemical Co., 170 Varick St., New York City. 6

### SANATORIA AND SANITARIA

Edward Sanatorium, Naperville, Ill. .... 32

Elmlawn (Wilgus) Sanitarium, Rockford, Ill. .... 25

Kenilworth Sanitarium, Kenilworth, Ill. .... 25

Michell Farm Sanitarium, Peoria, Ill. .... 36

Milwaukee Sanitarium, Wauwatosa, Wis. .... Front Cover

Norbury Sanitarium, Jacksonville, Ill. .... 25

North Shore Health Resort, Winnetka, Ill. .... 32

Rogers Memorial Sanitarium, Oconomowoc, Wis. .... 36

Waukesha Springs Sanitarium, Waukesha, Wis. .... 25

Weirick's Sanitarium, Elgin, Ill. .... 31

### RADIUM

Physicians Radium Assn., 55 E. Washington St., Chicago. 31

Radium and Radon Corp., 25 E. Washington St., Chicago. 33

### SCHOOLS

Pogue School, Wheaton, Ill. .... 26

### SURGERY INSTRUCTION

A. V. Partipilo, M. D., 1950 S. Ogden Ave. .... 26

### SURGICAL SUPPLIES

W. A. Baum Co., New York. .... 26

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Peoria City Medical Society	E. A. Garrett, Peoria	C. W. Magaret, Peoria.

(Continued on page 23)

(Continued from page 22)

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—Exchange.

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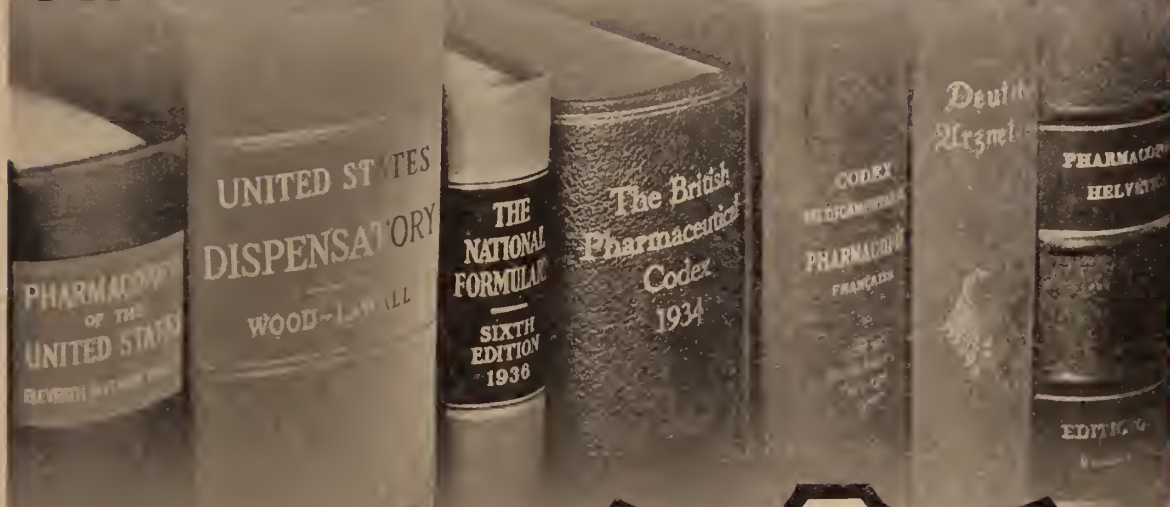
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Plantar warts are particularly suitable for radiation therapy; x-ray produces results as good as radium and may be preferable on account of the economy of time.

The radiation treatment of synovial cysts is frequently disappointing.

Benign lesions of the uterus can frequently be successfully treated with either x-ray or radium. A good rule to follow is to use radium when a curettage is indicated either for diagnosis or treatment; roentgen rays when it is not.

Radiotherapy will terminate bleeding or menstrual distress in about 97 per cent of cases of benign origin with a grossly normal uterus or uncomplicated fibromyomata.

The results of radium therapy are usually unsatisfactory in nevus flammeus (portwine mark) but good in nevus vasculosis (strawberry mark) and cavernous hemangioma.

The greater malignancy probably contrabalances the greater radiosensitivity in uterine cervical carcinoma and accounts for the fact of the relatively slight differences in the five-year salvages of the different grades of malignancy.

In cavernous hemangioma either surface (gamma radiation) or interstitial radiation should be used; carbon dioxide snow is NOT satisfactory.

The Paris (Regaud) technic of using relatively small amounts of radium in the treatment of uterine cervical cancer gives as satisfactory results (if not better) as those obtained by methods using much larger amounts of radium.

The normal uterine cervical tissue is capable of withstanding extremely heavy irradiation. Taking in account the relatively high malignancy in cervical cancer the aim should be to apply as intensive and as diffuse an irradiation as possible to all except the definitely hopeless cases.

Histologic examinations in uterine cervical cancer are not a very practical or reliable guide to either the prognosis or irradiation dosage. Papillary tumors, are, however, usually more radio-sensitive than those of the infiltrating type.

In uterine cervical carcinoma the radiosensitivity and the malignancy index tend to run more or less parallel; compared relatively to other tumors all cervical cancers are highly malignant.—*Exchange*.

## UNNECESSARY LETTER

"Well," said a dictatorial man after a long dissertation during an argument, "that seems to be the general impression that prevails among the masses."

"I'll have you understand, sir, that I am not one of the masses."

"I know that," said the other, getting up. "I prefixed the 'm' merely out of consideration for your feelings"

Have you heard about the Scotchman who was building a house and telephoned to the Masonic Temple for a couple of Free Masons?

## PROTECT YOUR PATIENTS AND YOURSELF

Do you know that you and your associates in the medical profession are losing millions of dollars every year? Do you know that by losing this money you are jeopardizing the health of the American Public?

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"Then how," you ask, "am I losing so much money and how am I endangering my patients?"

Ask yourself! Do you issue oral instruction instead of *writing* prescriptions? There is the answer!

Oral prescriptions are always unwise, sometimes dangerous. They not only "instruct" the patient how to treat disease, but they also tempt him to take a fling at the art of diagnosing his own and his friend's ailments. No one knows better than the doctor what disasters are bound to follow in the wake of amateur diagnoses and bungling "shot-in-the-dark" therapy. Even if a physician is called in later, the patient's chances have been impaired because of loss of precious time.

Oral prescriptions are unwise for another reason. They curtail the doctor's legitimate income and make it difficult for him to earn the livelihood that he and his family are dependent upon.

No matter how common or casual the ailment, no matter how standard or trademarked the remedy, it is to your advantage and to the advantage of your patient that you *write it* down under the traditional R sign. Then, and then only, can you be sure that your patient will return to you when he is in trouble—and that he will not pass on your oral advice to his friends and his friends' friends, when they really need the attention of yourself or some other reputable physician.

WRITE your prescriptions, doctor—even when you prescribe a well-known trademarked compound. WRITTEN prescriptions insure accuracy, tend to prevent the dangers of amateur diagnosis, and are economically just and wise. —*American Druggist*.

## THE PLAYFUL ASS—BY AESOP

An ass climbed up to the roof of a building and, frisking about there, broke in the tiling. The owner went up after him and quickly drove him down, beating him severely with a thick wooden cudgel. The ass said, "Why I saw the monkey do this very thing yesterday, and you all laughed heartily, as if it afforded you very great amusement."

Those who do not know their right place must be taught it. —*Aesop's Fables*.

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A man applied to a famous film producer for a super's job. Like so many other supers in Hollywood, he had had no work for weeks.

"Well," replied the magnate, "I might be able to use you. See me in a month's time."

"If you want me at all," replied the actor, "you'd better put me on the pay roll right now. There are a lot of other companies after me."

"Yes?" answered the director, who had heard that remark before. "And what companies are they?"

"Well," said the actor "there's the light company, the gas company, the telephone company, and—"

The director laughed and the man was put on the salary list.—*Exchange*.

### TURNING THE TABLES

At a certain trial quite a young doctor was called as an expert. Counsel for the other side in cross-examining the youthful medico gave utterance to several sarcastic remarks tending to throw doubt upon the ability of so young a man.

One of the questions was, "You are entirely familiar with the symptoms of concussion of the brain?"

"I am."

"Then," continued the cross-examiner, "suppose my learned friend, Mr. Taylor, and myself were to bang our heads together, should we get concussion of the brain?"

"Your learned friend, Mr. Taylor, might," suggested the young physician.



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## Book Notes

**THE DISEASES OF INFANTS AND CHILDREN** (Second Edition). By J. P. Crozer Griffith, M.D., Ph.D., Emeritus Professor of Pediatrics in the University of Pennsylvania; Consulting Physician to the Children's Hospital, Philadelphia; Consulting Physician to St. Christopher's Hospital for Children; Consulting Pediatricist to the Woman's, the Jewish, and the Misericordia Hospitals, etc.; Corresponding Member of the Société de Pédiatrie de Paris; and A. Graeme Mitchell, M.D., B. K. Rachford, Professor of Pediatrics, College of Medicine, University of Cincinnati; Medical Director and Chief of Staff of the Children's Hospital of Cincinnati; Director of the Children's Hospital Research Foundation; Director of Pediatric and contagious Services in the Cincinnati General Hospital. Second Edition. Revised and Reset. 1153 pages with 293 illustrations. Philadelphia and London: W. B. Saunders Company, 1937. Cloth, \$10.00 net.

This up-to-date work will prove useful to teachers and pediatricians, to general practitioners, to resident physicians and to graduate and undergraduate students. Some of the changes in the edition are as follows: Preventive measures have been emphasized; particular attention has been paid to the section dealing with anatomy and physiology, and growth and development. The subject of clothing has been carefully rewritten; the entire matter of artificial feeding has been put upon a simpler basis; methods of calculating calories and percentages has been retained; the charts on vitamins has been checked and brought up-to-date; the chapter on tuberculosis has been rewritten; additions have been made to the chapter on poisons; the treatment of dehydration in gastro-enteritis has been detailed by chart; congenital heart disease has been brought up-to-date and that which is helpful to the clinician in the newer knowledge of the endocrines has been added.

**CLINICAL ALLERGY.** By Albert H. Rowe, M.D. Philadelphia. Lea & Febiger. 1037. Price, \$8.50.

This work gives an up-to-date treatise on clinical allergy due to foods, inhalants, contactants, fungi, bacteria, and other causes including manifestations, diagnosis and treatments.

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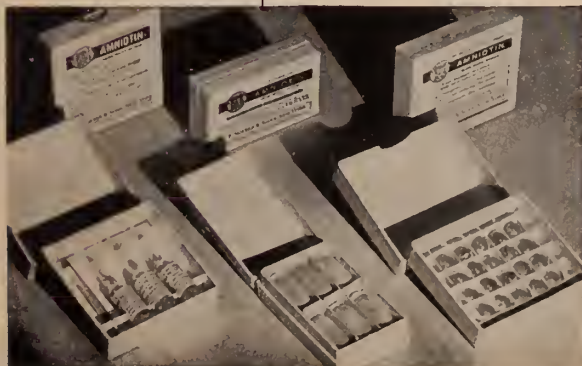
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